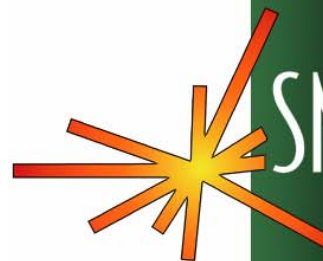


SNS 102030000-ES0007-R00

# SNS/CNMS Project Environmental, Safety, and Health Plan

January 2005



A U.S. Department of Energy Multilaboratory Project

SPALLATION NEUTRON SOURCE

Argonne National Laboratory • Brookhaven National Laboratory • Thomas Jefferson National Accelerator Facility • Lawrence Berkeley National Laboratory • Los Alamos National Laboratory • Oak Ridge National Laboratory

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**SNS/CNMS PROJECT ENVIRONMENTAL, SAFETY,  
AND HEALTH PLAN**

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Date Published: January 2005

Prepared for the  
U.S. Department of Energy  
Office of Science

UT-BATTELLE, LLC  
managing  
Spallation Neutron Source activities at  
Argonne National Laboratory      Brookhaven National Laboratory  
Thomas Jefferson National Accelerator Facility      Lawrence Berkeley National Laboratory  
Los Alamos National Laboratory      Oak Ridge National Laboratory  
under contract DE-AC05-00OR22725  
for the  
U.S. DEPARTMENT OF ENERGY

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## **1. SNS/CNMS SAFETY POLICY**

The safety of all personnel is recognized as a primary concern to all participants at Oak Ridge National Laboratory (ORNL), Spallation Neutron Source (SNS), and Center for Nanophase Material Science (CNMS). Unsafe conditions and unsafe behavior can result in injuries and deaths as well as impact schedules, cause financial losses, and damage professional reputations. As such, it is our goal that all Project participants plan, manage, and execute their respective operations with the ultimate goal of conducting their operations injury-free on a daily basis.

It is the responsibility of each Subcontractor to adhere to the requirements of this plan. Each Subcontractor shall incorporate safety into the planning of each task, assure the safety of their personnel, provide all safety devices necessary for their employees, establish a safe and drug-free work environment, and confirm that their equipment meets the applicable safety standards. Each Subcontractor is responsible for any actions of their personnel that may endanger or otherwise expose other participants to potential hazards on the project site.

The Integrated Safety Management System (ISMS) shall be used to achieve these goals. The ISMS is a practical approach to the prevention of accidents with an emphasis on line management responsibility for safety. A central premise is that work planning starts with a focus on the nature of the job to be performed and assessment of the hazards involved in each step. Through the use of self-assessment and feedback from the line organizations, continuous improvement in each Subcontractor's safety process is expected.

Project participants are required to supervise and direct the work, using their best management skills and technical expertise. The Subcontractor will be solely responsible for all construction means, methods, techniques, sequences and procedures. This includes all safety precautions and programs in connection with the work, as well as coordinating all portions of the work. Each lower-tier subcontractor is likewise required to be responsible for all safety precautions and programs in connection with the work under the Subcontractor's contractual agreement.

All personnel on the Project have stop work authority for any task that represents an eminent threat to safety. Only the Project Manager can authorize a restart of the identified task, with the concurrence of the Safety Coordinator.

Each Subcontractor will submit a written safety program in compliance with the Project safety requirements for review. This safety program will meet or exceed all applicable Project safety requirements.

## **2. INTRODUCTION**

ORNL, SNS, and CNMS have developed this plan for implementing the principles and functions of ISMS. The Project Manager and each Subcontractor's line management shall share the common goal to eliminate injuries to all employees and the down time associated with accidents. The requirements of the Occupational Safety and Health Administration (OSHA), ORNL, and this safety plan establish the requirements and minimum standards that the Safety and Health programs must meet or exceed.

### **2.1 GENERAL INFORMATION**

The objective of this plan is to emphasize that the protection of people and property is of paramount importance to the success of this project. To accomplish this objective, the Project is committed to the principles and functions of ISMS described in U.S. Department of Energy (DOE) Policy 450.4, Integrated Safety Management System (ISMS) and discussed in detail in Section 3.

Accident prevention is a continuing process, not a fixed program. The Project recognizes that Subcontractors may have their own specific safety requirements. It is, therefore, each subcontractor's

responsibility to identify to the Project how their programs will comply with the guidelines set forth in this plan before beginning work on the project site.

While it is the responsibility of each individual to work safely, it is ultimately each Subcontractor's management's responsibility to see that all safety and health policies and practices are followed and enforced. Active participation by each subcontractor's personnel in safety and health programs established for the Project is mandatory. Each Subcontractor's line management must demonstrate to their employees complete support and continuing involvement in all safety, and health policies and efforts.

Failure to fully carry out the responsibility to work safely and participate in the safety and health programs can result in removal of individuals from the Project at the direction of the Project Manager.

Safety is not to be compromised for production. Safety must be considered an integral part of the planning process. The Project's goal, along with the each subcontractor's goal, is to eliminate accidents. Each Subcontractor's line management is charged with the responsibility for developing, implementing, and enforcing the Safety and Health programs and policies established for the Project.

## **2.2 SUBCONTRACTOR'S SAFETY AND HEALTH PROGRAM**

A written safety program that complies with the requirements of this Plan must be submitted within five calendar days after award for review and approval by the Project Manager.

Each Subcontractor will budget to establish and maintain a safety and health program that meets or exceeds the requirements contained in this Plan and the applicable sections of 29 Code of Federal Regulation (CFR) 1926.

Each Subcontractor is solely responsible for carrying out their safety and health program. Therefore, the Project requires that each Subcontractor designate a competent on-site employee to carry out this responsibility. Along with the Subcontractor's line managers, this employee is directly responsible for ensuring that the Subcontractor's program and employee actions comply with the minimum safety standards required by this document.

## **3. INTEGRATED SAFETY MANAGEMENT SYSTEM**

The Project has adopted the ISMS by contract (DEAR Clause 970.5204-2) as the overarching philosophy and approach to integrate systematically safety into work activities. The ISMS is the formal, organized process whereby the SNS Project plans, performs, assesses, and improves safe conduct of work. The ISMS for the SNS Project is based on the fundamental principles and core functions discussed in DOE Policy, P 450.4. Each subcontractor is committed to these fundamental principles and functions through contractual agreement. The use and implementation of this plan is verified through the self-assessment and independent assessment processes.

The Project and its subcontractors are committed to ensuring the health and safety of workers and the public and to protecting the environment. All work will be performed safely and will adhere to all applicable laws and requirements. Integral to this being accomplished is the workers' commitment to work safely and to work to the requirements.

### **3.1 PRINCIPLES OF INTEGRATED SAFETY MANAGEMENT SYSTEM**

The fundamental principles described in DOE P 450.4, which are discussed below, are incorporated into the SNS Project's processes to help ensure that facilities are adequately preserved, that work is conducted safely, and that suitable accident preventive and mitigative measures exist.



### **3.1.1 Worker and Line Management Responsibility for Safety**

Line management is accountable for empowering workers with the training and authority necessary to establish and maintain safe operating methods commensurate with their assigned duties. Management expectations are clearly communicated to all personnel, personnel are empowered, their feedback is solicited, the tools necessary to accomplish the work safely are provided, and personnel are held accountable for their actions. Each individual, in turn, is responsible for his or her actions.

Line managers are responsible for training, motivating, and enabling their workers to understand and comply with the Project's commitment to safety, and for ensuring that work is accomplished within the authorization basis. Line managers are also responsible, by personal example and by involving their workers, for providing a working environment in which everyone is dedicated to meeting the commitment to safety.

### **3.1.2 Clear Lines of Authority**

The Project organizational structure focuses on management and worker involvement, and is centered on work planning and execution. Clear and unambiguous roles and lines of responsibility, authority, and accountability at all organizational levels must be established. Environmental, safety, and health (ES&H) responsibility will be integrated into the Project work activities, and interfaces for processes and organizations will be clearly established to provide for good understanding and communication.

### **3.1.3 Personnel Experience, Knowledge, and Skill**

Each Subcontractor must commit to using a workforce on the Project that has the ability to do work safely and efficiently. Each individual associated with the Project shall possess the experience, knowledge, skills, and abilities necessary to discharge his or her responsibilities. Line managers must ensure that their workers are competent to safely accomplish the work through the hiring and training processes. Line management must ensure that training and qualification requirements are flowed down to their personnel, and are responsible for their performance.

### **3.1.4 Balanced Priorities**

The Project ensures a "safety first" culture by effectively allocating, training, and monitoring resources to ensure that work is performed safely. A "safety first" attitude is a must for all personnel. Stop work authority is given to each employee to use when he or she believes an activity is unsafe. Restart approval is given at the appropriate management level. Specific job tasks are planned with appropriate worker involvement, and the work plan is required to be followed to ensure safe operation and environmental compliance.

### **3.1.5 Work and Associated Hazards**

Before work is performed, the associated hazards are evaluated and an agreed-upon set controls is established, which, if properly implemented, provides adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

### **3.1.6 Administrative and Engineering Controls**

Administrative controls and engineering controls are essential elements of the ISMS. Wherever feasible, engineered controls are designed into the Project, and administrative controls are used to supplement engineered controls as appropriate. These controls are established through the work planning process.

### **3.1.7 Authorization Agreement**

The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon by the Project Manager and subcontractor.

## **3.2 CORE FUNCTIONS OF INTEGRATED SAFETY MANAGEMENT SYSTEM**

DOE P 450.4 describes the core functions of an ISMS. These five functions are not independent and not necessarily sequential. Rather, they are linked and interdependent such that outcomes during the accomplishment of one may affect others. In particular, identifying and implementing opportunities for improvement may arise at any stage of the work process. The five functions are Define the Scope of Work, Identify and Analyze Hazards, Develop and Implement Hazards Controls, Perform Work within Controls, and Provide Feedback and Continuous Improvement.

Each Subcontractors line management must commit to these core functions of integrated safety management in the manner described below.

### **3.2.1 Define the Scope of the Work**

Defining the scope of work entails identifying and defining **all** the steps, each task and sub-task element, needed to complete a particular job safely. Defining the scope of work is a critical element of the safety management system, since it sets the stage for the scope and depth of hazard identification and analysis.

### **3.2.2 Identify and Analyze Hazards associated with the Work**

Hazard identification includes defining those hazards to workers or property expected to be encountered during the course of performing a particular task and those that are introduced from concurrent work tasks. A Job Safety Analysis/Job Hazard Analysis (JSA/JHA) shall be performed for each task to address such hazards. There is also a potential that unexpected hazards may be encountered or the nature of the known hazards might change as work activities proceed. Should this occur the JSA/JHA shall be amended to incorporate the new conditions.

### **3.2.3 Develop and Implement Hazard Controls**

The development and implementation of hazard controls includes identifying controls to prevent and mitigate hazards, establishing the safety envelope (what conditions require what response) and performing periodic hazard assessments.

### **3.2.4 Confirm Readiness and Perform Work Within Controls**

Confirmation of readiness is an effort to verify that safety controls have been implemented before starting work. Performing work within controls entails adherence to work controls in a manner such that activities remain within the safety envelope. Readiness assessments are conducted at multiple levels from each worker assessing his readiness to start a task to that necessary to demonstrate Project readiness to the DOE and regulators.

### **3.2.5 Provide Feedback on Adequacy of Controls**

Feedback and continuous improvement are based on the premise that all work activities can be planned, performed, assessed, and improved. Continuous improvement entails proactive focusing on problem prevention and performance improvement to prevent unsafe practices from occurring. The capability to prevent minor problems from becoming major risks or events relies heavily on feedback

from workers; observations from those not directly involved with the work, and adequate metrics to assess trends in performance.

### **3.3 ROLES AND RESPONSIBILITIES FOR INTEGRATED SAFETY MANAGEMENT SYSTEM IMPLEMENTATION**

#### **3.3.1 Senior Management**

The Project Manager has the overall responsibility for assuring a safe workplace and for maintaining safe operations. The Project Manager approves all Project plans, ensures implementation by conveying to line management their responsibilities for integration of safety performance into all work activities, and confirms management responsibility for integration of safety performance into all work activities. The Project Manager also has responsibility for evaluating the progress and health of the ISMS and adjusting resources as necessary based on feedback of ISMS implementation. This promotes continuous improvement in safety performance, and communicates the importance to the Project success.

#### **3.3.2 Line Organizations**

Each Subcontractor's Field Managers and Supervisors constitute the focus of "line manager responsibility" for the protection of workers, the public, and the environment within the ISMS framework for all work conducted by their assigned employees, and visitors in their assigned operating facilities.

Line managers provide the primary operating interface for employees and visitors. Within the framework of the ISMS, they contribute to work planning, pre-job communication of hazards and controls, work monitoring, and evaluation of results.

Effective integration of support from ES&H professionals into line activities is essential to achieving excellence in ISMS. Line management is responsible for defining and providing an adequate level of subject matter expert support, either from its own staff, or from external sources, as appropriate for the particular line organization and ES&H discipline involved.

#### **3.3.3 ES&H Organization**

As noted above, effective integration of ES&H into line activities is needed for success of the ISMS. The Safety Coordinator is responsible for providing overall policy and guidance on ES&H issues, and for working with the line organizations to make available necessary and agreed-upon input from ES&H professionals and other support. ES&H personnel are responsible for ensuring the standards, requirements, and ES&H policies are effectively translated into suitable controls for work activities.

#### **3.3.4 Workers**

All employees and on-site subcontractors are responsible for becoming knowledgeable of and maintaining awareness of the hazards associated with their work, for contributing to the formulation of hazard controls, and for conducting their work safely in accordance with those controls. They are encouraged to identify ES&H issues in their workplace, to work with their management to provide input for improvements and to resolve concerns, and to exercise stop-work authority in cases of imminent danger to health and safety of workers or the public, or threat to the environment.

## 4. SUBCONTRACTOR RESPONSIBILITIES

### 4.1 EXPECTATIONS

The safety procedures established for the Project are based on anticipated work activities. Future work activities may require the development of additional safety procedures or clarification of existing policies and procedures.

It is the responsibility of each employee to work in a safe manner. However, it is ultimately the Subcontractor's line management's responsibility to see that all safety and health rules and practices are followed.

Safety is never to be sacrificed for production. The safety goal for this Project is to eliminate the actions that cause accidents or illness.

Each Subcontractor has the explicit responsibility to perform work in accordance with this plan. Subcontractors' line managers are accountable for fulfilling the responsibilities listed in this section, in addition to compliance with their own company requirements and attending meetings to discuss or resolve safety issues. A Subcontractor with 40 or more total employees on-site must have a dedicated safety representative assigned to the site full time to carry out the duties described below. A Subcontractor with fewer than 40 employees onsite must delegate these duties to an on-site supervisor (who will be referred to as a safety **designee**).

### 4.2 FIELD MANAGER OR SUPERVISORS

Each Subcontractor's Field Managers and Supervisors have the responsibility for overall training, control, and conduct of personnel on their crew. As first-line supervisors, their role in the safety and health program is crucial because they set standards by which their employees work.

The field supervisors' responsibilities include, but are not limited to:

- Conducting task-specific safety training,
- Conducting daily safety inspections,
- Conducting safety sampling,
- Conducting toolbox safety meetings
- Keep the Project Manager apprised of any safety-related problems that have or may develop.
- Conduct investigations of all accidents and incidents and submit reports to the Project Manager.
- Compile OSHA statistical information and report this information to the Project

### 4.3 DEFINITIONS

**Dedicated Safety Representative.** A full time dedicated safety representative is an individual (1) scheduled to be onsite during work hours and (2) assigned to exclusively carry out safety-related duties. Specifically, the dedicated safety representative shall not have other responsibilities that may take his or her attention from the expected safety duties.

The individual is required to have 2 years or more of construction safety experience and comply with one of the following;

- Hold a current CSP (Certified Safety Professional) designation, or
- Hold a current CSHT (Certified Safety and Health Technician) designation, or
- Have completed the OSHA 30- hour Construction Safety and Health course within the past 24 months, or
- Have completed the OSHA 500 course within the past 24 months

**Safety Designee.** A safety designee is an individual who, in addition to other project-related duties, is responsible for performing safety-related duties.

As a minimum, this individual is required to have completed the OSHA 30-hour course within the past 24 months.

#### **4.4 ON-SITE SAFETY REPRESENTATIVE OR DESIGNEE**

The qualifications of the dedicated safety representative or of the safety designee must be submitted for review and acceptance by the Project Manager, prior to the assignment of this person to the project site. Acceptance shall depend upon:

- prior applicable construction experience,
- prior history of on-site safety functions, and
- safety training .

Specific responsibilities of the safety designee or the dedicated safety representative include, but are not limited to, the following:

##### **4.4.1 Employee Safety Orientation and Training**

- Conduct orientation sessions for employees new to the project site, prior to their beginning work.
- Participate in weekly toolbox safety meetings and assist field supervisors, as requested, with meetings.
- Instruct supervisors on safety rules and regulations.
- Instruct employees in the proper use and care of personal protective equipment.
- Instruct employees concerning special procedures (e.g., lockout, excavation, confined space entry, etc.) as required by OSHA and this Plan.
- Conduct or arrange for appropriate training

##### **4.4.2 Recordkeeping**

- Complete OSHA, state, federal, company, and Project-specific reports.
- Complete accident investigation reports.
- Complete inspection reports.
- Maintain training documentation.

#### **4.4.3 Safety Standards, Rules, and Regulations**

- Authority to stop work.
- Authority to take immediate corrective action.
- Implement, maintain, and update, as required, conditions and project site-specific safety policies and procedures.
- Interpret and implement site-specific safety policies and procedures.
- Demonstrate, by example, proper safety behavior.

#### **4.5 EMERGENCY SERVICES AND EQUIPMENT**

If a serious or life-threatening injury occurs, ORNL will provide emergency ambulance and fire fighting services. Subcontractor employees must use an SNS facility phone to dial 911 or pull a fire alarm box to notify ORNL for emergency response. If using a privately owned cell phone, Subcontractor must call the Laboratory Shift Superintendent (LSS) at 574-6606.

In the event of a less-serious injury, subcontract employees will be sent to physicians employed by the SNS/CNMS Comprehensive Insurance Program. The list of physicians will be provided to each subcontractor upon the initiation of work, and will be updated as required. In addition to the injury recordkeeping required by OSHA, each subcontractor shall inform the SNS/CNMS ES&H Manager of any injury requiring First-Aid and all more serious occupational injuries and illnesses within one hour of the classification of the injury.

#### **4.6 ORIENTATION**

All personnel will be required to attend the Project orientation provided by the Project Manager before working at the Project site. This shall include each Subcontractor's Owners and Officers.

Each Subcontractor's Manager shall ensure that their employees are briefed on what they can expect and what is expected of them on this project site.

Newly employed, promoted, and/or transferred personnel shall be fully instructed in the safety practices required by their assignments. All employees must receive orientation prior to starting work. Visitors must also receive orientation prior to leaving the office areas or be escorted while on the site. The initial indoctrination is to be performed by the Subcontractor's safety designee or dedicated safety representative. The orientation is required before an employee can receive a Project ID and enter the project site.

In addition to the Subcontractor's safety and health policies, the orientation must include:

- employee safety requirements and policies specific to the Project;
- site-specific safety and health requirements ;
- permitting procedures (if applicable), including work permits, hot work permits, etc.;
- hazard communication on a multi-employer work site;
- emergency and medical procedures; and
- other topics as circumstances require.

All employees will complete an Orientation Acknowledgment form at the end of the orientation. A copy will be submitted to the Project in order for the employee to obtain an ID badge.

## **4.7 SITE ACCESS**

Everyone on-site must have a valid driver's license and be able to speak English. Only those persons with a valid ORNL ID badge may enter the site, and only those workers enrolled in the Project may work on the site.

Badging procedures will be described to each contractor prior to initiation of work.

## **4.8 DRUG FREE WORK ENVIRONMENT**

### **4.8.1 Introduction**

ORNL and the Project are committed to providing a safe workplace for the workers assigned to the Project, promoting high standards of employee health, and fostering productivity that satisfies their Quality expectations. Consistent with the intent and spirit of this commitment, the Project has established a substance abuse testing specification for the Project with the goal of maintaining a work environment that is free from the effects of the use of illegal drugs and alcohol.

This specification is not intended as a substitute for the Subcontractor's complete written substance abuse policy. Normally, such policies include other important features, including, but not limited to, an employee education and awareness program, a supervisor-training program, and an employee assistance program.

### **4.8.2 Contractual Requirements**

All Subcontractors must have and enforce a written Substance Abuse Program incorporating the testing requirements, term, and conditions set forth in this plan. This plan is applicable to all employees, current and prospective, in order to be eligible to perform work at the project site. The Subcontractor must comply with this plan. Suppliers, vendors, and visitors are subject to confirmation of their abstinence from the possession or use of substances indicated in this plan. A copy of the substance abuse program must be submitted to the Project for approval prior to commencement of work on the project site.

The Substance Abuse Program must apply to the employees of the Subcontractors and subcontractors' of any tier working on the project site. This includes workers, new hires, replacement workers, and supervisory personnel. No employee or prospective employee of a Subcontractor shall be permitted to work on the project site unless such employee has submitted to testing as required by this plan and unless the results of such testing are negative as hereinafter defined. Subcontractor must provide the Project with a Monthly Summary Report of the Substance Abuse Program compliance.

All Contractors must train their respective employees in methods that will allow them to recognize substance abusers. Supervisory employees of the Subcontractor or its subcontractor shall be trained to take action, and to confront a substance abuser in a manner consistent with generally accepted safety training procedures.

The costs of implementing the Substance Abuse Program shall be borne by each respective Subcontractor affected by this plan.

The Project reserves the right to audit any substance abuse program required by this plan to verify compliance results within 24 hours of the Project's notification of intent to audit. The Project shall have free right of access to all relevant records of the subcontractor and their subcontractor's and suppliers for this purpose, provided such record disclosures are within the scope of guidelines pertaining to confidentiality of employee records.

The Contractors' pre-engagement employees who receive a positive test result shall immediately leave the project site. Transportation of employees receiving a positive test result is the direct responsibility of the employing Subcontractor. Furthermore, pre-engagement employees receiving a positive test result shall not be permitted to return to the project site earlier than 90 days from the date of the positive test. At that time the employee may begin the process outlined by this specification again.

If a current employee testing positive qualifies and successfully completes the Subcontractor assessment/substance abuse treatment program, a program approved by the Project, the employee will be exempt from the 90-day requirement if said employee agrees to the following:

- Submit to substance abuse testing as described in this specification and receive a negative test result; and
- Agree to random substance abuse testing not to exceed one test per 500 work hours over a 3-year period from the date of return to the project site.

#### 4.8.3 Testing Requirements

The Project requires:

- pre-engagement drug and alcohol testing;
- drug testing for reasonable suspicion of illegal drug use;
- post accident / incident drug and alcohol testing; and
- drug testing following discovery of illegal or unauthorized drugs or paraphernalia.
- All drug testing must be conducted by a National Institute of Drug Abuse certified laboratory with test results interpreted by a licensed medical review officer.
- The initial screen tests for alcohol shall be performed by using either a saliva test or a Breathalyzer test comparable to the type used by state or local law enforcement officials. Furthermore, alcohol confirmatory tests shall be performed by using either a blood alcohol test or a Breathalyzer test comparable to the type used by state or local law enforcement officials.

Substance abuse testing shall be conducted in accordance with specified requirements found in 10 CFR 707. Initially, the substances that will be screened will consist of the National Institute of Drug Abuse (NIDA) 5. However, the project reserves the right to expand the test panel to include the following substances should the need be established:

#### 10 PANEL TEST PLUS ALCOHOL

	Threshold limits	
	<i>Initial Limit</i>	<i>GC/MS Confirmation Limit</i>
Alcohol	0.04%	0.04%
Amphetamines	300 ng/ml	300ng/ml
Cocaine metabolites	300 ng/ml	150 ng/ml
Marijuana metabolites	20 ng/ml	10 ng/ml
Opiate metabolites	300 ng/ml	150 ng/ml
Phencyclidine	25 ng/ml	25 ng/ml
Barbiturates	300 ng/ml	100 ng/ml
Benzodiazepines	300 ng/ml	100 ng/ml
Methadone	300 ng/ml	100 ng/ml
Methaqualone	300 ng/ml	200 ng/ml
Propoxyphene	300 ng/ml	200 ng/ml

#### 4.8.4 Definitions

**Positive Tests:** Test results that indicate the presence of legal or illegal substances at or above the threshold limit as set forth in this plan.



**Negative Tests:** Test results indicating that legal or illegal substance are at levels below the threshold limits is set forth in this plan.

**Pre-engagement Testing:** Testing for all substances other than alcohol as set forth in this plan conducted by Subcontractors or its lower-tier subcontractors for their employees or prospective employees within 120 days prior to their appearance on the project site.

**For Cause Testing:** Testing for all substances set forth in this plan conducted by the respective Subcontractor for their employees whose behavior on the project site causes either the Project Manager/Project personnel or the respective Subcontractor supervisory personnel to reasonably conclude that such behavior may result from substance abuse.

**Post-Accident / Incident Testing:** Testing for all substances set forth in this plan conducted by the respective Subcontractor for their employees involved in an injury producing accident or a “near miss” in which injury is avoided or in events resulting in damage to property as determined by the Project Manager/ Project personnel or the respective Subcontractor supervisory personnel.

#### **4.9 DISCIPLINARY POLICY**

The purpose of this policy is to state the Project’s position on administering equitable and consistent discipline of unsatisfactory conduct on the jobsite. This policy ensures fair treatment of all employees in making certain that disciplinary actions are prompt, uniform and impartial. The primary purpose of any disciplinary plan is to correct the problem, prevent recurrence and prepare the employee for satisfactory service in the future.

We recognize that employees on the whole normally govern their activities while at work in the same high standards of conduct that they use for their personal affairs. But we recognize that errors in judgment may occur and when they do we wish to address them in a fair, impartial and consistent manner. By using progressive discipline, it is our hope that most employee problems can be corrected in the early stages, thus benefiting both the employee and the Project. Open and clear communications between the employee and the supervisor promotes understanding, and is the key to preclude the need for any disciplinary action.

Disciplinary action may call for any four of the following steps: Verbal warning, written warning, temporary suspension from the Project site, and denial of access to the Project site for a period of one year or more, depending on the severity of the problem and the number occurrences.

All disciplinary actions are based upon incident free time periods (rolling date). After an active employee has gone for a time period of one-year (365-days) without a reoccurrence of any progressive disciplinary action, all prior disciplinary action records will be removed from their personnel file. Records associated with terminations will not be purged from the files.

**All disciplinary actions resulting in suspension or termination will automatically be reviewed within twenty-four (24) hours by the appropriate Business Agent (if applicable), the subcontractor’s representative, Project Manager, and the SNS/CNMS ES&H Manager.**

Employees terminated for safety violations will not be eligible for re-employment on the Project for twelve (12) months. Employees terminated for a second time for a safety violation are ineligible for re-employment.

Appendix A provides the five (5) categories of offenses that require some form of disciplinary action in order to ensure corrective job performance, with only Class V offenses being characterized as the most serious and for which immediate termination will result.

#### **4.10 EQUIPMENT AND MACHINERY**

Subcontractor employees shall be trained in the operation, inspection, and maintenance of the equipment; and the safety features and procedures to be utilized during operation, inspection, and maintenance of the equipment. This training shall be based on the equipment operating manual and the hazard analysis for the activity.

Before any machinery or mechanized equipment is placed in use, it shall be inspected and tested by a competent person and certified to be in safe operating condition. Inspections and tests shall be in accordance with manufacturer's recommendations and shall be documented. Records of tests and inspections shall be maintained at the site by the subcontractor, and shall be made available upon request, and shall become part of the official project file.

All machinery and equipment shall be inspected daily (when in use) to ensure safe operating conditions. The Subcontractor shall designate competent persons to conduct the daily inspections and tests. Tests shall be made at the beginning of each shift during which the equipment is to be used to determine that the brakes and operating systems are in proper working condition and that all required safety devices are in place and functional.

Whenever any machinery or equipment is found to be unsafe, or whenever a deficiency which affects the safe operation of equipment is observed, the equipment shall be immediately taken out of service and its use prohibited until unsafe conditions have been corrected. A tag indicating that the equipment shall not be operated, and that the tag shall not be removed, shall be placed in a conspicuous location on the equipment.

Machinery and mechanized equipment shall be operated only by designated qualified personnel. Machinery and equipment shall not be operated in a manner that will endanger persons or property nor shall the safe operating speeds or loads be exceeded. Utilize equipment only for the purpose for which it was designed and in accordance with the manufacturer's instruction and recommendations. Modifications, extensions, replacement parts, or repairs of equipment shall maintain at least the same factor of safety as the original equipment. Modifications shall be authorized in writing by the manufacturer.

#### **4.11 EVACUATION OF THE WORK AREA**

Subcontractor shall observe and participate in notices to evacuate the work area. The evacuation notices may be a drill or actual event. Evacuate to the assembly point identified in the orientation/JSA. Before evacuating the work area, shut down or make safe equipment or processes which could become a safety or fire hazard if left unattended.

#### **4.12 ACCIDENT/INCIDENT INVESTIGATIONS AND REPORTING**

All incidents, involving illness/injury, property damage, or neither ("near miss"), must be immediately reported to the Project Manager. This is to include repairable damage to equipment or materials and all but minor first aid cases. Such incidents must be investigated by the Subcontractor's safety representative or designee and documented on a Project Incident Investigation Report (Appendix B). The report must be completed and submitted to the Project Manager within 24 hours of the incident. The Project reserves the right to conduct an independent investigation of any incident.

An incident investigation committee will investigate all major incidents. This includes, but not limited to, any incident resulting in a medical case, lost-time injury, fatality, damage to property or equipment or a "near-miss" that could have resulted in such an incident. The committee will review the incident scene, interview all involved or witnessing parties, review all facts pertaining to the accident, and file a report of the findings and conclusions as well as recommended measures to prevent re-occurrence to the Project Manager. The committee will be comprised of, but not limited to:

- the person(s) involved in the incident,
- the first-line supervisor of the person(s) involved in the incident,
- the superintendent of the employing Subcontractor,
- the safety representative or designee of the employing Subcontractor,

- the safety representative or designee of the Subcontractor, and
- the Project Safety Coordinator, or designee.

#### 4.13 PERSONAL PROTECTIVE EQUIPMENT

The Subcontractor is responsible for providing the appropriate personal protective equipment (PPE) in all operations/tasks where there is an exposure to hazardous conditions or where there is the need for using such equipment to reduce the hazards to the employees.

PPE and safety equipment shall be tested, inspected, and maintained in serviceable and sanitary condition as recommended by the manufacturer. Regulations governing the use, selection, and maintenance of personal protective equipment are described in 29CFR1926.28 and 29CFR1926 Subpart E.

Users of PPE and Safety equipment shall be trained in the use, limitations, inspection, testing, and maintenance of the equipment.

**Basic Eye Protection**—Employees must wear ANSI Z87 approved safety glasses with sideshields 100% of the time while in the construction areas, including entering and leaving the site.

**Contact Lenses**—Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments might represent an additional hazard to contact lens wearers. Hazardous environments include, but are not limited to, those in which a respirator may be required or where welding is being performed.

**Goggles**—If the task requires an employee to wear goggles, basic eye protection should not be worn since a good seal cannot be obtained.

**Face Shield**—When Subcontractor's employees are exposed to flying particles, splashes, mists, etc., they must wear an approved face shield as well as basic eye protection (since a face shield provides only protection to the face and eyes from direct impact objects).

**Welding Shield**—When welding, both basic eye protection and hard hats must be worn with a welding shield. This is to protect employees from popping hot slag when the shield is raised and from overhead work exposures. If welding goggles are worn basic eye protection is not required while welding.

**Head Protection**—All persons working in or visiting hard hat areas shall be provided with and required to wear protective headgear. Hard hat areas are those with potential of head injury: all construction areas are considered hard hat areas.

**Hearing Protection**—The safety representative or designee will monitor work areas to identify and post high noise areas as required by 29 CFR 1926.52 and provide appropriate hearing protection.

**Foot Protection**—Subcontractor personnel must wear leather ANSI Z41 protective work shoes or boots. No one is permitted to wear sneakers, tennis shoes or athletic shoes of any type, sandals, high heels, or thongs on the project site.

**Clothing**—Employees are to report to work properly attired. The Project's requirements include:

- Clothing in good repair. (Frayed or tattered clothing can be hazardous to employees and will not be permitted);
- No tank tops or sleeveless shirts. (Shirts must have at least 2" sleeves and tails be tucked in at all times);
- Long pants only. (No short pants, cutoffs, sweat pants, etc.);
- If working around moving machinery, no neckties, gauntlet type gloves and/or baggy, loose or ragged clothing;
- No loose, dangling jewelry. (Jewelry such as rings, watchbands, necklaces, earrings and the like can cause or contribute to accidents;

- Shoulder length or longer hair must be tied back and put under the hard hat or worn in a hair net. (This will keep it from impeding vision, becoming entangled in machinery, or preventing the use of personal protective equipment).

#### **4.14 ON-SITE SAFETY INSPECTIONS**

Subcontractor's supervisors are to conduct a weekly review of the area and forward a copy of the report to the Project Manager's safety representative or designee.

#### **4.15 WEEKLY TOOLBOX MEETINGS**

Subcontractor's supervisors are to conduct weekly toolbox safety meetings. Records of the meetings retained on-site by the subcontractor.

#### **4.16 PROTECTION OF WORK AREAS**

Subcontractor must ensure that the work areas and storage areas are conspicuously flagged and barricaded, as needed, prior to initiation of work.

Subcontractor must furnish, post, erect, and install safety devices, equipment, signs, barricades, flagging, and any other item necessary to give adequate warning and caution of hazards, and to provide instructions and directions to workers and the public.

#### **4.17 WORKING AND STORAGE AREAS**

Housekeeping is a general indicator of a Subcontractor's performance on-site, including safety performance. Each Subcontractor has the responsibility to maintain their area of operations, and those of their lower-tier subcontractors, in an orderly condition free of materials that could create slip/trip or fire hazards. All requirements of 29 CFR 1926.25 must be met. In addition, the Subcontractor's Supervisors shall ensure a daily walkdown of their work area is conducted, that any deficiencies are immediately corrected, and the condition of the site is reported to the Subcontractor's Field Manager.

All materials and equipment in storage, laydown, staging, or work areas must be properly secured so that they are stable and secure against sliding or collapse. All materials storage and loading/unloading areas must be established a safe distance from walkways, aisles, and traffic areas to avoid personnel injury should materials slide or collapse.

#### **4.18 HAZARDOUS MATERIALS AND HAZARDOUS WASTE**

- All Subcontractors will provide to the Project Manager a list of hazardous materials that will be used on the project site.
- U.S. Environmental Protection Agency (EPA) ID number shall be obtained for the hazardous wastes produced by the Subcontractors.
- All hazardous wastes produced by the Subcontractor must be packaged, transported, and disposed of by a licensed entity. Such loads shall be manifested and a copy of the manifest sent to the Project Manager. All hazardous materials must be properly labeled and stored until removed from the project site (by a licensed hazardous waste hauler).
- Hazardous materials or hazardous wastes stored in 30-gallon or 55-gallon drums are to be placed on spill containment pads.

- Report all accidental releases of a hazardous material or hazardous waste promptly to the Project Manager. If the release is of a reportable quantity, the Project Manager will notify the appropriate regulatory agency.
- The responsible Subcontractor will do proper cleanup of accidental releases of hazardous materials waste. Cleanup is to be done by properly trained personnel. Hazardous waste from the cleanup must be hauled away by a licensed hauler. The Project Manager must be given a copy of the hauler's manifest.
- Depending on the hazardous materials spilled, the Project Manager may require the responsible Subcontractor to hire a certified laboratory to take an appropriate number of soil samples to test at their laboratory. A copy of the results is to be given to the Project Manager.
- Subcontractor must inspect their hazardous material and waste storage areas at least weekly to ensure they are properly maintained.
- The Subcontractor will randomly audit the labeling and storage of hazardous material and waste and the disposal of hazardous waste to verify that all subcontractors, at any tier, are fulfilling their roles as responsible parties.

## **5. HAZARDOUS WORK REQUIREMENTS**

### **5.1 JOB HAZARD ANALYSIS**

A Job Safety Analysis (JSA) shall be conducted on any and all tasks. The JSA shall identify the task and the steps necessary to complete the task, the hazards associated with each step of the task, and the means to protect the workers performing the task from those hazards.

Supervisors and employees are responsible for performing a hazard analysis of their work activities and identifying those activities that require a written hazard analysis. The supervisor is also responsible for:

- Ensuring that hazard analyses are developed and reviewed by the employee before work begins.
- Ensuring that employees are trained in the process of developing a hazard analysis.
- Seeking advice of the safety officer or designee as appropriate

Should conditions change or unexpected hazards arise the JSA shall be amended to account for the new conditions and the workers rebriefed on the changes. The participation of workers who may be assigned to perform the tasks is strongly encouraged.

An example of a typical JSA is illustrated on the following table. Also, JSA worksheet/guidelines are presented in Appendix C.

<b>Table 1. JSA Example</b>		
Principal steps	Hazards	Controls
Vehicle Operations	Accidents	All operators must have valid licenses and certifications.
Excavation of 7 foot trench using backhoe or similar equipment	General physical hazards (manual lifting, slips, fall, contact with moving equipment, work near trench margin)	<p>Take “2” to review tasks, hazards, and controls.</p> <p>Hard-hat, safety glasses, work boots, work clothes require.</p> <p>Establish a safety zone radius the length of the fully extended excavator arm.</p> <p>Only authorized and necessary personnel in the safety zone.</p> <p>Functional back-up alarm on excavator.</p> <p>Work gloves required for material handling.</p> <p>No one-person lifting over 55 pounds, proper lifting technique.</p>
	Trenching physical hazards	<p>Identify soil type.</p> <p>No trench entry permitted by personnel without proper shoring, guarding, or slope construction.</p> <p>Soils stored 14 feet from trench edge.</p>
Excavation of 7 foot trench using backhoe or similar equipment (continued)	Fire	<p>Flammables stored in safety cans with flame arresters.</p> <p>Fire extinguisher <math>\geq</math> 20AB 25 to 50 feet from outside flammables storage.</p> <p>Ignition sources prohibited in fuel storage or handling areas.</p> <p>Fuel storage areas must be marked with “No Smoking or Open Flame” signs.</p> <p>Bonding (metal to metal contact) during pouring.</p> <p>Gasoline powered equipment will be shut down during filling.</p>
	Electrical shock	<p>Maintain clearance from overhead and buried electrical utilities.</p> <p>Verify that no utilities have been installed in the immediate vicinity of the trenching.</p> <p>Notify CM of location and depth to dig.</p>
	Exposure to chemicals	None anticipated. Wash face and hands prior to taking anything by mouth.
	Biological hazards	<p>Notify On-site Medical Provider of any severe allergies to insect stings.</p> <p>PPE (boots, work clothes, taped pant legs). Insect repellent, as necessary.</p>

## 5.2 COMPRESSED GAS CYLINDERS

All compressed gas cylinders shall be transported, handled, used, and stored in accordance with 29CFR1926.350.

### General Requirements

- Ensure that these containers are not defective or leaking any product.
- Prescribed stamped markings on the container shall be located on the shoulder of the cylinder.
- The labels applied by the gas manufacturer or authorized supplier/vendor to identify the container contents shall not be defaced or removed.

- Containers may be painted by the gas suppliers to permit the suppliers to help recognize their contents and to segregate them more readily in their handling operations. However, the primary identifier is the container label. Color shall not be used to exclusively identify container content.
- Containers not bearing a legibly written, stamped, or stenciled identification of the contents shall not be used.
- Compressed gas cylinders shall not be used as rollers, supports, or for any purpose other than to contain and use the content as received.
- The container valve shall be kept closed at all times (charged or empty), except when the container is in use.

### **Transporting Cylinders**

- Compressed gas containers shall not be rolled in the horizontal position or dragged. A suitable hand truck, forklift, or similar material handling device should be used with the container properly secured to the device.
- Containers shall not be lifted by using the container cap or magnets. In cases where hand trucks are designed to lift containers using the cap, the containers shall not be lifted higher than 6 inches or for longer than it takes to properly position the container on the hand truck.
- Ropes, chains, or slings shall not be used to suspend containers unless provisions have been made on the container for appropriate lifting attachments, such as lugs. Where appropriate lifting attachments have not been provided on the container, suitable cradles or platforms to hold the containers shall be used for lifting with the containers being adequately secured.

### **Storage**

- Containers are not to be stored near readily ignitable substances, such as gasoline, oil, or scrap material.
- All compressed gas cylinders shall be stored and used valve end up. The cylinders shall be secured to prevent instability.
- Valve protection caps should always be in place and hand tight, except when cylinders are in use or connected for use.

## **5.3 CONFINED SPACE**

A Confined Space means a space that:

- is large enough and so configured that an employee can bodily enter and perform assigned work; and
- has limited or restricted means for entry or exit for example, tanks, vessels, silos, storage bins, hoppers, vaults, and pits are spaces that may have limited means of entry); and
- is not designed for continuous employee occupancy.

A Permit-Required Confined Space is a confined space that has one or more of the following characteristics:

- contains or has the potential to contain a hazardous atmosphere;
- contains a material that has the potential of engulfing an entrant;

- has an internal configuration such that an entrant could be trapped or asphyxiated by inwardly converging walls or by a floor which slopes downward and tapers to a smaller cross-section; or
- contains any other recognized serious safety or health hazard.

For entry into non-permit spaces a job safety analysis, work guideline, or a standard operating procedure is required. Entry into a permit-required space requires a confined space permit (see Appendix D).

Operations involving a confined space entry require an evaluation of work by the Subcontractor and the Project Manager's S&H Representative to classify the space as Permit-Required or Non-permit.

Retrieval equipment shall be provided to facilitate non-entry rescue for all Permit-required spaces unless evaluation of the Permit-required confined space determines that the use of retrieval equipment creates greater health and safety hazards. In this case, rescue services shall be notified that entry into the confined space will be necessary to perform rescue operations.

## 5.4 ELECTRICAL SAFETY

- Conduct electrical installation and maintenance operations in accordance with requirements in 29 CFR 1926 Subpart K, applicable requirements in 29 CFR 1910 Subpart S, and the National Electrical Code.
- Ensure electrical work is performed by qualified persons as defined in 1910.331-335.
- Provide a ground fault circuit interrupter for cord sets, receptacles, and electrical tools including plug and cord connections to generators and equipment for employee use.
- All unfinished circuits are to be tested for energy, capped with wire nuts, and pushed into the box by an electrician. All employees are to be instructed that any wires not capped are assumed to be live, and are to be reported to an electrician.
- Provide three-wire extension cords, continuous length without splices, and designed for hard or extra-hard use. Protect electrical extension cords from pinch points, sharp edges, pedestrian or vehicle traffic, or other potentially damaging configurations. Do not fasten extension cords with staples, hang with nails, or suspend on wires. Arrange extension cords in a manner that avoids creating tripping hazards.
- Notify the Project Manager prior to any work being done near overhead lines. Overhead lines shall be de-energized and grounded or other protective measures (guarding, isolating, insulating, etc.) shall be provided, before work is performed in the vicinity of overhead lines. This will be accomplished by ORNL Electrical Power Operations Group

Any vehicle operated in proximity to overhead lines shall maintain the following minimum distance:

- Ten feet (305 cm) for voltage of 50 kV or below;
- Ten feet (305 cm) plus 4 inches (10 cm) per 10 kV for voltage greater than 50 kV
- Four feet (122 cm) for vehicles in transit, with its structure lowered for voltages 50 kV or below, with clearance increased 4 inches (10 cm) for every 10 kV over that voltage.

**Live parts to which an employee might be exposed shall be put into an electrically safe work condition before an employee works on or near them, unless the deenergizing introduces additional or increased hazards or is infeasible due to equipment design or operational limitations.** Energized parts that operate at less than 50 volts to ground and containing less than 10 Joules of stored electrical



energy are not required to be deenergized if there will be no increased exposure to electrical burns or to explosion due to electric arcs.

The hazard analysis is utilized to ensure workers understand their role in the work to be performed, as well as what others involved in that project or task will be doing. Supervisory approval for “working on or near” or “working hot” shall be given in the Permit (Appendixes E and F). **“Working on or near” or “working hot” requires approval by the Subcontractor Supervisor, SNS CNMS Project Manager, SNS/CNMS Electrical Safety Officer, and SNS/CNMS Level II Manager. Subcontractor shall follow the guidelines presented in Appendixes G, H, I, J, K, L, and M for determining approach boundaries and PPE. These Appendixes were derived from NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces.**

## **5.5 ELEVATED WORK/FALL PROTECTION**

Each Subcontractor must provide appropriate 100 % fall protection for its employees working six feet or more above the work surface. This includes steel erection. This fall protection must comply with 29 CFR 1926 Subpart M. The Subcontractor’s Field Manager must fully evaluate the work conditions and environmental factors (including seasonal weather changes) before selecting the appropriate fall protection system (active, passive or a combination of measures, as appropriate). Such evaluation is to be included in the JSA for the task.

Employees shall be trained in the selection and safe use of fall protection systems before the equipment is used. This can be accomplished in a safety meeting or pre-job briefing.

### **Types of Fall Protection Systems**

- Personal fall arrest system (PFAS): a means used to arrest an employee in a fall from a work level. It consists of an anchorage, connectors, and a body harness and will include a lanyard, deceleration device, lifeline, or a combination of these. Anchorage shall be capable of sustaining static loads, applied in the directions permitted by the PFAS, of at least 5,000 lbs per user attached.
- Restraint: The full body harness is used as a component of a restraint system to prevent the user from reaching a fall hazard. Anchorage must support a minimum of 3,000 lbs. per person attached.
- Work Positioning: The full body harness is used as a component of a work positioning system to support the user at a work position. Anchorage must support at least 3,000 lbs per person attached.
- Warning line system is a barrier erected to warn employees that they are approaching an unprotected edge. It also designates an area in which work may not take place without the use of a guardrail, personal fall arrest system, or a safety net to protect employees.
- Guardrail system is a barrier erected to prevent employees from falling to lower levels. All guardrails must meet the requirements of 29 CFR 1926.502
- *Controlled access zone* is an area in which certain work (e.g., overhead brick laying) may not take place without the use of guardrail, personal fall arrest or safety net systems and access to the zone is controlled.
- *Safety monitoring system* is a system in which a competent person is responsible for recognizing and warning employees of fall hazards.
- *Safety net system* can be used when workplaces are more than 25 feet above the ground, water surface or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines, or a safety harness is impractical.

## **5.6 EXCAVATION/PENETRATION**

The Excavation/Penetration permit process is utilized to provide for the safety of personnel and protection of existing utilities and facilities during work activities requiring excavations and/or penetrations into structures.

Prior to excavation/penetration, the estimated location of utility installations (e.g., sewer, telephone, water, fuel, electric lines) underground and in walls, floors, etc. shall be determined and protected from damage or displacement. The Project Manager shall be contacted to locate the installations. Before excavation/ penetration, the Project Manager Field Representative will provide the Seller with an Excavation/Penetration Permit (Appendix G). The permit shall be posted at the work site.

For penetrating activities (including installation of fasteners less than 2") where the subsurface elements are unknown, the following requirements will be performed:

- assuring GFCI protection on electrically-operated equipment/tools;
- connecting non-double insulated electrically operated equipment/tools with an insulated #8 AWG or larger copper conductor;
- connecting non-electrically operated coring/cutting machines to ground with an insulated #8 AWG or larger copper conductor;
- requiring appropriately rated electrically insulated gloves;
- investigate/survey for identification of subsurface elements.

Excavation/penetration work activities excluded from the permit process are as follows:

### **Excavation Activities**

- Maintenance replacements of the same location, depth, and size as the items being replaced (i.e., sign posts, bollards, poles, asphalt milling, etc.)
- Soil borrow areas pre-designated by Project Manager
- Earth/rock excavations 12 inches or less in depth with surface area not in excess of 25 square feet, using hand-held tools excluding jackhammers.

### **Penetration Activities**

- Work associated with the installation of fasteners 2 inches or less in embedded depth to concrete floors, walls, and ceilings.
- Penetration of hollow-core walls and ceilings.
- Penetration of masonry walls.
- Penetration of soil borrow areas pre-designated by Project Manager.
- Penetration of pavements and sidewalks not in excess of their thickness.

## **5.7 FLAMMABLE AND COMBUSTIBLE LIQUIDS**

- Subcontractor shall comply with applicable sections of 29CFR1926.150, *Fire Protection* and 29 CFR 1926.152, *Flammable and combustible liquids*.
- Only approved containers and portable tanks shall be used for storage and handling of flammable and combustible liquids. Approved safety cans or Department of Transportation approved containers shall

be used for the handling and use of flammable liquids in quantities of 5 gallons or less( this does not apply to those liquids which are extremely hard to pour, which may be handled in original containers). For quantities of 1 gallon or less, the original container may be used, for storage, use and handling of flammable liquids.

- Containers of flammable and combustible liquids shall be tightly capped when not in actual use.
- Flammable liquids may be used only where there are no open flames or other sources of ignition within 50 feet of the operation, unless conditions warrant greater clearance.
- All sources of ignition shall be prohibited in areas where flammable and combustible liquids are stored, handled, and processed. Suitable No Smoking Or Open Flame signs shall be posted in all such areas.
- Areas where flammable or combustible liquids are transferred at one time, in quantities greater than five gallons from one tank or container, shall be separated from other operations by 25 feet distance or by construction having a fire rating of at least one hour.
- A fire extinguisher, rated not less than 10B, shall be provided within 50 feet of wherever more than five gallons of flammable or combustible liquids are being used on the job site. This does not apply to the integral fuel tanks of motor vehicles.
- The Project/ORNL will provide fire fighting services. Subcontractor employees must use a facility phone to dial 911 or pull a fire alarm box to notify ORNL for emergency response. If using a privately owned cell phone, Subcontractor must call the Laboratory Shift Superintendent (LSS) at 574-6606.

## **5.8 HAND AND POWER TOOLS**

- Hand and power tools shall be used, inspected, and maintained in accordance with 29CFR1926 Subpart I and the manufacturer's instructions and shall be used only for the purpose for which designed.
- Power tools designed to accommodate guards shall be equipped with such guards when in use. Reciprocating, rotating, and moving parts of equipment shall be guarded if exposed to contact by employees or otherwise create a hazard.
- Tools and equipment showing evidence of safety hazards shall not be brought on site. Should hazards become evident after work is initiated, remove the tool from use, clearly indicate the tool is not to be used, and take the tool from the site at the end of the work shift.

## **5.9 HAZARD COMMUNICATION**

- Subcontractor must demonstrate compliance with a written hazard communication program as required by 29 CFR 1926.59 including employee information and training, provisions for labeling, and availability of MSDSs as a section of the Seller S&H Plan.
- Subcontractor shall maintain MSDSs for hazardous chemicals brought onsite and shall supply information regarding hazardous chemicals to the Project representative prior to initiation of activities that may potentially expose Project personnel to a hazard at the job location.
- The Project Manager shall provide the Subcontractor MSDSs and any information about any chemical hazards to which the Subcontractor employees may be exposed from Project operations.

- Subcontractor shall remove all unused chemicals or materials brought to the site at the completion of the job.

## **5.10 HEAT AND COLD STRESS**

Personnel exposed to temperature extremes shall be protected in accordance with the American Conference of Governmental Industrial Hygienists (ACGIH) guidelines by implementing appropriate engineering controls, work-rest regimens, and/or personal protective equipment.

## **5.11 HOISTING AND RIGGING**

Perform hoisting and rigging activities in accordance with 29 CFR 1910 Subpart N, 29 CFR 1926 Subparts H and N, and ANSI B30 and B56 Series. Provide for review by Project S&H representative, documents of certification that Subcontractor's hoisting and rigging equipment meets the requirements in these documents. If an inspection certificate expires while the equipment is on site, re-inspect the equipment and update the inspection certificate before continuing work activities.

Equipment operators/riggers, including alternates, shall be qualified to perform their assigned functions. Qualifications shall include physical, knowledge, and skills proficiency based on job function.

All operations that require hoisting and rigging shall have a Job Safety Analysis (JSA) and /or an appropriate safety checklist completed prior to beginning work to ensure safety and compliance.

Classify each lift as ordinary or critical.

### **5.11.1 Critical Lift**

A lift will be considered critical when any one of the following conditions exists:

- The load item is unique and, if damaged, would be: (1) irreplaceable; or (2) not repairable and is vital to a system, facility, or project operation;
- The cost to replace or repair the load item or the delay in operations of having the load item damage would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.
- When a lift involves more than one crane or other motorized lifting device lifting a common load
- The lift exceeds 75% capacity of crane
- The load requires exceptional care in handling because of size, weight, close-tolerance installation, high susceptibility to damage, or other unusual factors
- All lifts over 50 tons
- Collision, upset, or dropping could result in significant release of hazardous material or other undesirable conditions

There are other conditions which **might** constitute a critical lift and should be evaluated by the Subcontractor. Such conditions include:

- Lifts that are made where the load could fall on pipelines or vessels containing flammable gases or liquids
- Lifts in tight spaces
- Lifts involving nonrigid objects like tank shells

- Lifts with lifting points below the center of gravity of the load

The Critical Lift Plan/Permit (Appendix H) must be developed by the subcontractor in conjunction with its safety and health plan and obtain reviews/approval from the following personnel:

- Subcontractor Lift Supervisor
- Subcontractor Safety and Health Representative/Designee
- Operators performing the lift
- Project Engineer
- Project Manager
- Project Safety and Health
- SNS/CNMS Level II Manager

Required attachments to the Critical lift plan include:

- Crane operator certification must be issued through a Certified Competent Person and must be up-to-date. All operator certifications must be attached to the plan or be on file.
- Type, size, capacity, engineered designs, and manufacturer of shackles, hooks, jacks, rollers, come-a-longs, spreader bars and slings
- Type, size, capacity rating, manufacturer, capacity certificates, and inspection reports for all cranes and other lifting equipment
- Lift geometry and free body diagrams to illustrate the individual tensions of each sling involved in the lift, and any shift of weight when the load is lifted
- A complete rigging diagram must be attached to the critical lift plan. The rigging diagram must include the entire rigging process and the following minimum information when it applies:
  - Type and capacity of lifting equipment
  - Crane boom length, radius, and location of outriggers
  - A plot of the path of travel including all vertical and horizontal clearances from such items as adjacent equipment, power lines, and other encumbrances or hazards
  - Location, size and capabilities of lifting lugs, slings, and other rigging accessories as well as the method of attachment
  - Position of load in relation to the boom to show hook clearance and distance between the boom and the load
  - Description, size, capacity, and location of miscellaneous equipment such as dollies, jacks, hand wrenches, rollers, etc.
  - Location of mats and cribbing used before, during, and after the lift
  - Location and orientation of equipment
  - Location of underground lines (utility lines, electrical duct banks, cables, etc.), abandoned vessels and tanks, and foundations

Critical lift permits must be submitted to the Project Manager/Engineer nominally two (2) working days prior to making the lift.

### **5.11.2 Ordinary Lift**

Any lift which does not meet the definition of a critical lift is considered an ordinary lift. The JSA will suffice as the lift plan for ordinary lifts. The JSA must contain the following information:

- Description of lift to include weight, dimensions, center of gravity, and objects to be lifted
- Hoisting and rigging equipment with capacities
- Rigging sketches/drawings

Ordinary lift plans (JSA) must be reviewed and approved by the subcontractor's field supervisor and safety and health representative.

### **5.11.3 Safe Rigging Practices**

- Determine the weight of the load before designing the method that will be used to lift it. Consider whether vessels will contain fluid, sludge, internal equipment, etc. These items can add significantly to the nominal weight and can create dynamic motion.
- If possible, distribute the load evenly on all legs of a sling.
- When using multiple leg slings, keep in mind that the load is not always divided equally.
- The 4-leg slings shall be rated as 3-leg slings, since it cannot always be determined that all legs will be loaded equally. Other multiple leg slings should be given due consideration for possible uneven loading.
- Check choker rotation to eliminate jerking or slipping while upending or laying down.
- When fastening chain hoists, or snatch blocks to permanent structures, verify that the structure is strong enough to support the load.
- Always refer to the manufacturer's specification chart for safe working loads of shackles.
- Never replace the shackle pin with a bolt; only the proper fitted pin shall be used.
- The crane rated loads do not account for the weight of rigging accessories, like blocks, auxiliary boom head, hooks, slings, spreader bars, jibs, material handling equipment, and other elements of lifting tackle. Their combined weight must be added to the total weight.
- The maximum safe working load of cranes is determined from static loads. The capacity charts do not take into account impact loads due to the dynamic motions of the load or crane.
- Are softeners required to reduce cutting to the slings?
- Conduct a detailed investigation to identify all possible interference in the vicinity of the work including overhead, at grade or underground.
- Prior to lift, develop a method of unhooking and hooking up the load.
- Always assure that rigging is placed to assure proper orientation of piece in final position.
- Surveying equipment may be needed to insure that loads remain within vertical and horizontal limits and to assure stability during the lifting operation.

#### **5.11.4 Safety Precautions for Lifting in Tight Spaces**

- Plot in detail the location of the crane and/or other equipment with respect to the work, including location of outriggers.
- Establish limits of allowable motion for the boom in both the vertical and horizontal directions for each crane location in order not to damage existing facilities.
- Devise and provide means to protect existing operating facilities. Mechanically protect small protrusions on operating equipment, such as valves, instrumentation, brackets, etc., which could be damaged if contact is made with the load.
- Consider shutting down and depressurizing operating equipment which could be jeopardized by the lift.

#### **5.11.5 Method of Attachment and Handling**

- If attachment points or lifting lugs are provided on the piece, verify that they are intended for handling operations to prevent damage.
- What are the manufacturer's care and control restrictions of the object to be lifted during handling the entire piece and not a component.
- Are there any requirements for shipping skids or other handling devices and their availability.
- Review the sequence of proper assembly or disassembly when the structure consists of components.

#### **5.11.6 Lifting Lug Requirements**

- Lifting lugs must be engineered to withstand the load plus an additional 125 % of the load as a safety factor.
- All engineering of the lugs must be done by a certified engineer.
- Welds on both old and new lifting lugs must be magnetic-particle tested to ensure soundness.

#### **5.11.7 Matting Requirements**

- Matting must be made of through bolted hard wood, or heavy duty 12" X 12" crane timbers.
- Matting must be thoroughly inspected before use.

#### **5.11.8 Ground Stability**

- Ascertain the load carrying capacity of the soil and beware of recently excavated and backfilled areas or areas with weak soils having limited bearing capacity. Examine the rigging diagram to verify that cranes, dollies, and trailers are adequately supported and that the diagram includes cribbing or mats under the crane and outriggers where required.
- Check the entire path of movement during the lift for all holes, rocks, and soft ground.
- Check all load restrictions on floors, structures and access roads.

### 5.11.9 Tag Lines

- Always use a tag line even for smaller lifts unless the tag line increases the hazard. It is much easier to maintain control of the lift than to regain control when it is swinging or spinning.
- There shall be no knots in the trailing end of tag lines.

## 5.12 LOCKOUT/TAGOUT

LOTO procedures must be strictly followed when it is necessary to work on any equipment that may release any form of hazardous energy including, but not limited to, electrical, rotational, mechanical, chemical, hydraulic, or pneumatic energy, while the equipment is shut down.

LOTO is required whenever servicing, maintenance, or modification is being performed on equipment in which the unexpected energization or startup of the equipment, or the release of stored energy, could cause injury to people or damage to equipment. All sources of hazardous energy must be shut off and secured. LOTO must be performed by each person who works on the equipment.

The Project Manager will perform a lockout/tagout of applicable Project controlled systems and equipment. Subcontractor must provide at least two (2) working days advance notice to the Project field representative of systems requiring lockout/tagout.

Following the initial isolation and lockout/tagout by the Project, a representative of the Subcontractor shall review and approve the protection provided. Subcontractor employees shall verify isolation, and overlock isolation points (or a lockbox) with their personal locks. These locks shall be identified with the Subcontractor employee's name and a unique employee identification number ( a tag can be used to provide identifying information).

Upon completion of work, Subcontractor employees shall remove all personal locks and notify the Project field representative. The removal of the Project lock(s) shall not precede the removal of the Subcontractor's lock(s).

Hazardous energy sources introduced by the Subcontractor must be controlled through the use of Subcontractor's hazardous energy control procedure. The procedure/JSA must include/address the following:

- Assess energy type and magnitude:  
The authorized employee must assess the type, magnitude, and hazards of the energy to be controlled.
- Determine methods of control:  
The authorized employee must determine the appropriate methods of controlling the hazardous energy; e.g., disconnect switch or valve. **Note: push buttons, selector switches, interlock circuits, and other control type devices are not energy-isolating devices.**
- Notify all affected personnel:  
The authorized employee must notify all affected employees of the impending shutdown, the reasons for it, and anticipated duration of shutdown.
- Shutdown:  
The authorized employee must verify that it is safe to shut down the equipment.
- Perform normal equipment shutdown:  
The authorized employee must turn off or shut down the equipment using established methods for that equipment.
- Isolate and lock out energy sources:  
The authorized employee must operate the energy-isolating device and affix his/her LOTO lock to this device. The lock must be affixed so as to hold the energy-isolating device in an off or safe position that physically prohibits normal operation of the energy-isolating device. Where more than



one authorized employee is involved in the job and a Group LOTO procedure is not used each authorized employee must affix his/her personal lock using a multiple lock hasp.

- Enter required information on tag:  
The tag is used to provide identifying information. The authorized employee must complete all appropriate information on the tag. If the placement of the tag would compromise safety by obscuring indicator lights or controls, the tag may be located as close as is safely possible to the device, in a position that will be immediately obvious to anyone attempting to operate the device. Where more than one authorized employee is involved in the job, and a Group LOTO procedure is not used each authorized employee must affix his/her own personal tag on a multiple lock hasp.
- Releasing stored energy:  
The authorized employee must completely release or otherwise control any stored energy. In the case of stored mechanical energy, vent valves, spring releases, blocking devices, or equipment repositioning (as appropriate) must be utilized. In the case of stored electrical energy, approved grounding wands or discharge devices must be used.

If there is a possibility of reaccumulation of stored energy to a hazardous level, verification of isolation must be continued until the servicing, maintenance, or modification is completed or until the possibility of such accumulations no longer exists. The equipment must be in a Zero-Energy State.

- Verification of LOTO Application procedure:  
Attempt to restart the equipment. The authorized employee must physically attempt to operate the energy-isolating device and attempt to restart the equipment using the normal equipment controls (e.g., start buttons or computer software controls).

If the equipment is electrical, the authorized employee must additionally test potential electrical energy sources using appropriate instruments or testers. The authorized employee shall use test equipment to verify that the circuit elements and equipment parts are de-energized, and shall also determine if any energized condition exists as a result of inadvertently induced voltage or unrelated voltage back-feed even though specific parts of the circuit have been de-energized and presumed to be safe. If the authorized employee is not qualified to test the energy being isolated, he/she must ensure that a qualified person tests the energy. If the circuit to be tested is over 600 volts, nominal, the test equipment must be checked for proper operation before and immediately after this test. Note: All test equipment must be checked for proper operation regardless of the voltage. Circuits over 600 volts may require special test equipment.

**Although electrical LOTO verification/Testing is only properly performed on de-energized equipment, there can be occasional surprises (e.g. multiple feeds or sources, or stored electrical energy) and such verification may indeed be on or near unexpectedly energized (live) electrical parts. The qualified worker must approach the hazard with the assumption that the system is energized until it is verified to be de-energized, and as such must follow the guidelines presented in Appendixes G, H, I, J, K, L, and M for determining approach boundaries and PPE. These Appendixes were derived from NFPA 70E, Standard for Electrical Safety Requirements for Employee Workplaces. The “working on or near” or “working hot” Permit (Appendix F) is not required for LOTO verification/testing.**

- Release from LOTO:  
Before LOTO devices are removed and energy is restored to the equipment, the authorized employee must:
  - Verify that it is safe to reenergize. The authorized employee must verify that the work for which the LOTO was applied has been completed and that it is safe to reenergize equipment. The authorized employee must check the work area to ensure that all tools and personnel are at a safe distance from the equipment.

- Remove all isolating and grounding devices. The authorized employee must check the equipment to ensure that any removed guards are reinstalled.
- Remove lock and tag, reset the energy-isolating device, and return the machinery to service. The authorized employee must notify all affected employees that the equipment is back in service.

### **5.13 RESPIRATORY PROTECTION**

The Subcontractor will determine which respirator type or class will offer adequate protection based on:

- the respiratory hazard(s) to which the worker may be exposed;
- the workplace and user factors that have the potential to affect respirator performance and reliability;
- his or her informed professional judgment;
- the scientific literature.

The Subcontractor shall provide respirators in accordance with the following:

- If subcontractor employees are required to wear negative or positive pressure, tight-fitting respirators, they shall have been medically evaluated
- Ensure respirator wearers have completed the respirator quantitative fit testing and respirator training.
- Provide respirators and cartridge type specified to protect worker from exposure to identified or suspected hazards as specified in the JSA.
- Provide breathing air, if required. Submit data to Project Field Representative demonstrating the compressed breathing air quality supplied to the air respiratory protections systems meet the ANSI/CGA G7.1, Commodity Specification for Air, requirements.
- Provide optical corrections for appropriate respirators.
- All respirators shall be NIOSH- certified.

### **5.14 SANITATION**

An adequate supply of drinking water shall be provided by the Seller. Portable drinking water dispensers shall be designed, constructed, and serviced to ensure sanitary conditions, shall be capable of being closed, and shall have a tap. Containers shall be clearly marked as to their contents and shall not be used for other purposes. Water shall not be dipped from containers. The common drinking cup is prohibited.

When sanitary sewers are not available, chemical toilets and hand washing facilities shall be provided and maintained by the Project.

## **5.15 SCAFFOLDING**

All scaffolds and platforms must meet the following requirements:

### **5.15.1 General Requirements**

OSHA requires that scaffolds are to be erected, moved, altered, and dismantled only under the supervision and direction of a qualified Competent Person experienced in scaffold erection and maintenance. The scaffolding Competent Person shall not have other responsibilities that could take his or her attention from the scaffolding work.

Each working level or platform of scaffolds must be completely decked and have handrails, midrails, and toeboards installed. If for some reason, a platform or working level cannot be equipped with standard handrails or completely decked, safety harnesses must be worn and properly tied off in compliance with the established fall protection requirements.

Chain guardrails on scaffolding are not allowed.

Scaffolds that will be higher than 30 ft and a working load exceeding 50 lb ft<sup>2</sup> requires a licensed professional engineer to complete sealed and signed design drawings, including load calculations. Examples are scaffolds erected for plasterers, masons, or any other trades who routinely store material on the platform.

Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means.

Contact the Project Manager if any special scaffolding issues arise.

Scaffolds must be inspected prior to each shift and tagged for the workers. Tagging must designate the requirements of the user and the conditions of the scaffold.

### **5.15.2 Rolling Scaffolds**

No one is to ride on a rolling scaffold while it is being moved.

All materials and tools must be secured prior to moving a rolling scaffold.

No rolling scaffolds will be utilized to support other scaffolds.

### **5.15.3 Scaffold Planking**

Paint or stamp scaffold planks within 12" of each end or edge to denote use for scaffold decking only.

Use only 2" × 10" or 2" × 12" scaffold grade material for scaffold planking.

### **5.15.4 Scaffold Tagging**

The scaffold tagging procedures are as follows:

- The crew that erects the scaffold must complete and attach the appropriate scaffold tag.
- The scaffold tag must be placed at eye level on or near the access ladder so it is easy to locate and plainly visible.
- A Competent Person needs to ensure that the scaffold is erected properly and the tag attached is proper and completely filled out.
- If the scaffold needs to be altered in any way, the person who signed the tag must be contacted to authorize the change and re-tag if necessary.
- An untagged scaffold must not be used.
- A Competent Person must inspect it prior to each shift.
- Tagging System procedure:

- A green tag is completed and attached by the erecting crew to scaffolds that have complete handrails, midrails, toeboards, and decking.
- A yellow tag is completed and attached to scaffolds that cannot be erected with all the components complete. The yellow tag allows the erecting crew to note what portion of the scaffold is incomplete and cautions the user. A yellow tag also informs the user fall protection is required.
- A red tag means the scaffold is being dismantled, not yet completely erected or for some reason not safe and shall not be used.
- Under rare circumstances non-traditional scaffolding techniques may be required prior to installation. Appendix I shall be completed and submitted to the Project Manager for approval.

## **5.16 WELDING, CUTTING, AND HOT WORK**

Any work involving burning, welding, grinding, or similar operations that is capable of initiating fires or explosion shall be conducted in accordance with 29CFR1926 Subpart J and NFPA 51B.

The Subcontractor shall have a permit system addressing S&H and fire prevention for the following applications when work is conducted in a non designated area; welding and allied processes, grinding, heat treating, thawing pipes with a torch or flame, torch-applied roofing, powder driven fasteners, hot riveting, and similar applications producing a spark or flame. Designated areas are permanent locations designed or approved for hot work operations to be performed regularly. Appendix J is an example of a hot work permit.

All hot work operations shall be coordinated with the Facility Manager/ Project Manager, or designee.

The supervisor of the work to be performed shall inspect the area to ensure that preparations are complete, safe conditions exist, and ensure that all listed precautions on the permit have been considered and checked as met or not applicable.

Welders and burners shall wear protective clothing which meet requirements of ANSI Z49.1. The selected clothing shall be specified in the JSA for hotwork activities. Protective clothing requirements shall be determined and noted on each hotwork permit issued during this project. Fire watchers who may be exposed to the same hotwork hazards as the welders and burners shall also wear the selected protective clothing.

A fire watch must be designated if any of the following conditions exist:

- A significant amount of combustible material is closer than 35 ft to the point of operations;
- A significant amount of combustible material is more than 35 ft away, but could be easily ignited by sparks;
- Hot work is conducted in areas where the employee must wear multiple layers of clothing and respiratory protection.

The fire watch shall be instructed to:

- Remain present in direct line of sight to the work area and perform no other activities other than fire watch duties;
- Be alert for any condition that could lead to a fire;
- Guard passers-by from welding hazards;
- Interrupt the work when a hazardous condition develops and deal with the situation appropriately;

- Ensure that appropriate fire extinguishing equipment is readily available and know how the equipment is to be used;
- Remain on the scene for at least thirty minutes after completion of hot work to detect and report a fire resulting from stored heat.

## **6. ENVIRONMENTAL PROTECTION AND WASTE MANAGEMENT**

This section provides environmental protection and waste management requirements for on-site construction activities.

### **6.1 STORM WATER POLLUTION PREVENTION AND CONTROL**

- Prior to mobilization to the site, perform an inspection of equipment containing liquid systems including, but not limited to, bulldozers, backhoes, bobcats, drill rigs, trucks, hoists, and cranes, to ensure no leaks exist. Verify hoses, tubing, and hydraulic lines are in good operating condition. Make all necessary repairs before delivery of equipment or vehicles to the construction site.
- Perform daily inspections to ensure continued good operating condition of equipment and promptly repair all deficiencies.
- Store all materials indoors or otherwise protected from weather.
- For outdoor painting operations, minimize overspray, and use tarps/vacuums/enclosures to contain sandblasting waste and paint chips from paint removal operations.
- Petroleum products stored in quantities greater than 500 gallons shall be appropriately labeled and have secondary containment capable of preventing any release to a drainage system or the environment.
- Do not allow liquids, including but not limited to, gasoline, diesel fuel, lubricating oil, or antifreeze to enter the storm sewer systems, waterways, drainage ditches, or the ground.
- Use due caution when operating oil-bearing equipment near aquatic resources . Where necessary, implement appropriate control measures, including but not limited to the use of physical barriers (plastic or tarps, berms, etc.) and or absorbent materials to prevent leaks or spills from entering waterways.
- Maintain a 25-foot minimum buffer zone from streams, be aware of storm drain inlets, and cover or contain debris stored outside.
- Flushing empty concrete trucks or dumping excess concrete is prohibited. Transport excess concrete back to the batch plant. The truck chute may be washed at the work site. Flush the truck chute at designated on site location. The SNS/CNMS Project Manager will designate the location. Solidified cement waste from truck chute cleaning is solid waste and shall be cleaned up and transported to the Landfill.
- Conduct all pipeline sterilization, flushing, hydro-testing, etc. in a manner protective of the environment. The SNS/CNMS Project Manager will designate the approved discharge location(s).
- Water used to sterilize or flush pipelines cannot be released directly to the environment due to possible high concentration of chlorine. The SNS/CNMS Project Manager will determine the appropriate storage/treatment and will designate the approved discharge location.

- Unless otherwise directed by the SNS/CNMS Project Manager, all chlorinated or treated water shall be discharged through a treatment/detention basin and monitored for chlorine levels, other contaminants when applicable, and standard water quality indicators. The treatment/detention basin may consist of a field-constructed structure or portable tank.
- Storm water accumulated in excavated areas, chlorinated rinse water, and chlorinated water used to sterilize/flush pipelines shall not be directly discharged, or otherwise allowed to enter the storm systems, waterways, or drainage ditches without written approval from the SNS/CNMS Project Manager.

## **6.2 EROSION PREVENTION AND SEDIMENT CONTROL**

- Manage excavated soil and spoil material in a manner protective of the environment. Cover stockpiled material to prevent erosion and/or install appropriate sediment controls. Use due caution during excavation or any other soil management in the vicinity of sanitary or storm systems, waterways, or drainage ditches.
- All erosion prevention measures and sediment controls (silt fence, straw bales, catch basins, etc.) shall be in place and approved by the SNS/CNMS Project Manager prior to beginning excavations, road building, etc. Sediment barriers such as silt fence and straw bales shall be entrenched and of sturdy construction.
- Perform inspection of erosion and sediment controls on a weekly schedule, prior to expected storm events and after each heavy rainfall event. Document each inspection.
- Where appropriate, provide temporary or permanent modifications to surface terrain gradient (soil or crushed stone berms, sediment retention basins, etc.) in order to minimize the flow of storm water into or out of excavated or otherwise disturbed areas.
- All erosion and sediment control measures shall be maintained throughout the course of the project and removed at completion of project and appropriate measures taken to return the area to its previous state. Maintenance shall include but not be limited to removal of accumulated sediment, repairs and or replacement of storm damaged or otherwise deteriorated structures.
- All disturbed areas shall be stabilized as soon as practicable by appropriate means, including but not limited to the use of mulch or other temporary cover, seeding with vegetative ground cover, etc.

## **6.3 SPILL PREVENTION AND CONTROL**

- Report all spills promptly to the Project Manager. If the release is of a reportable quantity, the Project Manager will notify the appropriate regulatory agency.
- The responsible Subcontractor will perform proper cleanup of accidental releases of materials. Cleanup is to be done by properly trained personnel. Hazardous waste from the cleanup must be packaged, transported, and disposed of by a licensed entity. The Project Manager must be given a copy of the hauler's manifest.
- Depending on the materials spilled, the Project Manager may require the responsible Subcontractor to hire a certified laboratory to take an appropriate number of soil samples to test at their laboratory. A copy of the results is to be given to the Project Manager.
- For inside work, provide a spill kit, prevent spills to floor drains and do not discharge waste into any ORNL systems without approval.

- For outside work, provide a spill kit, inspect equipment for leaks, and repair leaking equipment in a timely manner.

#### **6.4 CONSTRUCTION WASTE MANAGEMENT**

- Subcontractor will provide containers and/or transport vehicles for excess property for salvage, universal waste, sanitary/industrial waste, and construction/demolition debris.
- Waste Minimization principals shall be incorporated in construction activities to ensure the greatest environmental benefits and minimize future liability for the waste that is generated.
- All work will be performed in a manner that maximizes salvage and recycling and waste disposal to landfills shall be minimized.
- Characterization methods and procedures will be employed by all parties to the contract to ensure that the characteristics of the waste are known and adequately recorded during all stages of the waste management process.
- Subcontractor will be responsible for properly handling and disposing of all wastes generated.

## APPENDIX A: DISCIPLINARY ACTIONS BY OFFENSE CLASS AND OCCURRENCE

OFFENSE	FIRST	SECOND	THIRD
<b>Class I</b> <ul style="list-style-type: none"> <li>• Creating or contributing to unsanitary conditions due to poor housekeeping</li> <li>• Posting or removing notices on bulletin boards without permission</li> <li>• Eating in unauthorized areas</li> <li>• Failure to report the use of prescription drugs</li> <li>• Unauthorized soliciting of contributions on SNS Project</li> <li>• Smoking in unauthorized areas (Note: This may be upgraded to a Class V offense if in a hazardous area)</li> </ul> <p>For Fourth Offense, next step in Progressive Disciplinary Policy is 30-day suspension, followed by Access Denial for the Fifth Offense within a 365-day time period.</p>	Verbal reprimand	Written reprimand	3-day suspension
<b>Class II</b> <ul style="list-style-type: none"> <li>• Unauthorized use of equipment, tools, or machinery</li> <li>• Failure to observe traffic and parking rules on SNS project</li> <li>• Horseplay</li> </ul> <p>For Fourth Offense within a 365-day time period, next step is Access Denial.</p>	Written reprimand	3-day suspension	30-day suspension
<b>Class III</b> <ul style="list-style-type: none"> <li>• Gambling on SNS site</li> <li>• Disregard for safety rules (other than those mentioned elsewhere)</li> <li>• Failure to report an injury or accident</li> </ul>	3-day suspension	30-day suspension	Access denied to site
<b>Class IV</b> <ul style="list-style-type: none"> <li>• Threatening or intimidating other employees or supervisors</li> <li>• Intentionally punching another employee's timecard, dropping brass, or using another ID badge</li> </ul>	30-day suspension	Access denied to site	
<b>Class V</b> <ul style="list-style-type: none"> <li>• Any violation of safety procedures that contribute to the potential for loss of life or limb (see Note 1 for examples)</li> <li>• Possession of weapons or firearms on company property, including site parking areas</li> <li>• Possession of drugs, alcohol, and related paraphernalia on company property, including site parking areas</li> <li>• Any other violations of the Drug Free Work Place policy</li> <li>• Theft of property from company, client or other employees</li> <li>• Assault on a supervisor or other employee</li> </ul>	Access denied to site		
Note 1: Examples of Safety Violations <ul style="list-style-type: none"> <li>• Failure to comply with Company 100% fall protection policy</li> <li>• Violation of confined space entry procedures</li> <li>• Violation of First Break procedure</li> </ul>			

NOTE: This policy is designed to set minimum standards and is not meant to supercede a subcontractor's policy or policies which may be more stringent.

### SNS/CNMS Progressive Discipline Policy

#### Acknowledgement:

I have read and understand the Project policy on discipline. I further understand that not following the company or client's rules and regulations will result in disciplinary action up to and including denial of Project site access.

\_\_\_\_\_  
Print Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Witness

\_\_\_\_\_  
Date



## APPENDIX B: INCIDENT INVESTIGATION REPORT

Page 1 of 2

### PART 1

Date of Incident:	Time of Incident:	Date of Investigation:
Company:		Contract Number:
Location of Incident:		
Describe what the employee was doing at the time of the incident:		
Did injury result? Yes / No ____. If No proceed to Part 3	If yes SSN(s) Proceed to Part 2	<input type="checkbox"/> Employee Name(s) <input type="checkbox"/> <input type="checkbox"/>

### PART 2

Body part(s) affected:		
Disposition: Employee Sent to	<input type="checkbox"/> Doctor <input type="checkbox"/> Emergency Room <input type="checkbox"/> Personal Physician <input type="checkbox"/> On-Site Medical Station <input type="checkbox"/> Other	<input type="checkbox"/> Employee refused treatment Result impression <input type="checkbox"/> 1 <sup>st</sup> Aid Only <input type="checkbox"/> Medical Recordable <input type="checkbox"/> Lost Time or Restricted Duty
Type of Injury:		
Employee Supervisor:		
Witnesses:		
Circle the Number Identifying Contributing Factors:		
1. Absent/Improper Guarding 2. Defective Equipment 3. Weather/Temperature 4. Inappropriate PPE 5. Inadequate Housekeeping 6. Slippery/Uneven Walking Surface 7. Improper Layout of Work Area 8. Inadequate Ventilation 9. Inadequate Lighting or Noise Control 10. Improper Storage or Placement of Materials 11. Insect/Animals in Work Area 12. No At Risk Condition Identified 13. Other	14. Operating Without Authority 15. Improper Use of Equipment 16. Inadequate Procedures 17. Use of Defective Equipment/Tools 18. PPE Not Used 19. Inadequate Training 20. Improper Position or Posture 21. Horseplay 22. Altercation 23. No At Risk Act Identified 24. Other _____ _____ _____	

### PART 3

How Did The Incident Occur?		
What Object or Substance was Involved?		
Any Previous or Similar Incidents?	Project Specific:	Company Wide:
What Factors Contributed to the Incident		

Was an SPA/JSA developed for the task being performed? Yes/No \_\_\_\_, If yes, attach a copy.

What **corrective actions** are being taken to prevent recurrence? Also list the person responsible for implementing and the target completion date for each item.

\_\_\_\_\_  
 \_\_\_\_\_

Supervisor/Investigation Team Members:

\_\_\_\_\_  
 Name(s)

\_\_\_\_\_  
 Signature(s)/Date

Reviewed by:

\_\_\_\_\_  
 Contractor Safety Representative/Date

\_\_\_\_\_  
 Program Safety Manager/Date

**APPENDIX B: INCIDENT INVESTIGATION REPORT**

Page 2 of 2

**WITNESS STATEMENT**

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Social Security Number: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Temporary Address: \_\_\_\_\_ Phone No. \_\_\_\_\_

Permanent Address: \_\_\_\_\_ Phone No. \_\_\_\_\_

\_\_\_\_\_

Location at Time of Incident: \_\_\_\_\_

Describe, to the best of your knowledge, what happened just before, during, and just after the incident:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signature

Attach to Incident Report

## APPENDIX C: JOB SAFETY ANALYSIS WORKSHEET (JSA)

Page 1 of 2

Title of Job/Operation \_\_\_\_\_ Date \_\_\_\_\_

Analysis Performed By: \_\_\_\_\_

Prime Contractor or Subcontractor \_\_\_\_\_

Reviewed By: \_\_\_\_\_

Sequence of Basic Job Steps	Potential Accidents or Hazards	Recommended Safe Job Procedures

Potential Hazards:

- |     |                         |     |
|-----|-------------------------|-----|
| 1.  | Struck By               | SB  |
| 2.  | Struck Against          | SA  |
| 3.  | Contacted By            | CB  |
| 4.  | Contact With            | CW  |
| 5.  | Caught On               | CO  |
| 6.  | Caught In               | CI  |
| 7.  | Caught Between          | CBT |
| 8.  | Fall-Same Level         | FS  |
| 9.  | Fall to Different Level | FDL |
| 10. | Overexertion            | OE  |
| 11. | Exposure                | E   |

## **APPENDIX C: JOB SAFETY ANALYSIS WORKSHEET (JSA)**

Page 2 of 2

### **JOB SAFETY ANALYSIS (JSA)**

#### **STEP 1.**

Identify jobs posing the greatest accident risk.

#### **STEP 2.**

Prioritize selected jobs into four (4) main areas.

1. Jobs with high accident frequency
2. Jobs with lower frequency but higher severity
3. Jobs with serious injury potential
4. New jobs with no accident history

#### **STEP 3.**

Conduct job analysis

1. Use either the direct observation method or the discussion method.
2. For best results observe and discuss job using an experienced employee in that job.

#### **STEP 4.**

You need an understanding of the types of accidents possible in your workplace and you must review the records of the past accidents.

There are six (6) categories of accidents:

1. Struck (By or against)
2. Contact (abrasion, electric shock, etc.)
3. Caught (in, on, between, under)
4. Fall (from elevation or same level)
5. Over exertion (stress or strain)
6. Exposure (exposed to gases, fumes, mists, etc.)

#### **STEP 5.**

Develop recommended safe work procedures. Use complete JSA to conduct initial training of new employees, or to review safe procedures with existing employees. JSA are also useful for accident investigation as a resource.

## Confined Space Entry Permit – Part I

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**NOTE:**

### Worker Feedback:

## **11. Authorization Approvals**

## 12. Confined Space Entry Log (to be completed by Attendant)

<b>Permit Terminated by Entry Supervisor (signature):</b>	<b>Badge:</b>	<b>Date:</b> <u>  </u> / <u>  </u> / <u>  </u>	<b>Time:</b>
---	---------------	--	--------------

**Continuous improvement recommendations (if none, state so):**

<b>Debriefing Conducted by</b> (signature):	<b>Badge:</b>	<b>Date:</b> / /	<b>Time</b>
---	---------------	---------------------	-------------

**NOTE:**

## APPENDIX E: ELECTRICAL JOB BRIEFING AND PLANNING CHECKLIST

(This Appendix is derived from NFPA 70E.)

Appendix illustrates considerations for an Electrical Job Briefing Checklist.

### Identify

- ☐ The hazards
- ☐ The voltage levels involved
- ☐ Any “foreign” (secondary source) voltage source
- ☐ Any unusual work conditions
- ☐ Number of people needed to do the job
- ☐ The shock protection boundaries
- ☐ The available incident energy
- ☐ Potential for arc flash (Conduct a flash-hazard analysis)
- ☐ Flash protection boundary

### Ask

- ☐ Can the equipment be energized?
- ☐ Are backfeeds of the circuits to be worked on possible?
- ☐ Is a “standby person” required?

### Check

- ☐ Job plans
- ☐ Single-line diagrams and vendor prints
- ☐ Status board
- ☐ Information on plant and vendor resources up to date
- ☐ Safety procedures
- ☐ Vendor information
- ☐ Individuals are familiar with the facility

### Know

- ☐ What the job is
- ☐ Who else needs to know – Communicate!
- ☐ Who’s in charge

### Think

- ☐ About the unexpected event...What if?
- ☐ Lock – Tag – Test – Try
- ☐ Test for voltage – FIRST
- ☐ Use the right tools and equipment, including PPE
- ☐ Install and remove grounds
- ☐ Install barriers and barricades
- ☐ What else?

### Prepare for an emergency

- ☐ Is the standby person CPR trained?
- ☐ Is the required emergency equipment available? Where is it?
- ☐ Where is the nearest telephone?
- ☐ Is confined space rescue available?
- ☐ Are radio communications available?
- ☐ What is the exact work location?
- ☐ How is the equipment shut off in an emergency?
- ☐ Are the emergency telephone numbers known?
- ☐ Where is the fire alarm?
- ☐ Where is the fire extinguisher?

**APPENDIX F: ENERGIZED ELECTRICAL WORK PERMIT**  
(This appendix derived from NFPA 70E)

**ENERGIZED ELECTRICAL WORK PERMIT**

**PART I: TO BE COMPLETED BY THE REQUESTER**

Job/Work Order Number \_\_\_\_\_

- (1) Description of circuit/equipment/job location: \_\_\_\_\_  
\_\_\_\_\_
- (2) Description of work to be done: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- (3) Results of the Shock Hazard Analysis: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Requester/Title

\_\_\_\_\_  
Date

**PART II: TO BE COMPLETED BY THE ELECTRICALLY QUALIFIED PERSONS *DOING* THE WORK:**

**Check when complete**

- (1) Detailed job description procedure to be used in performing the above detailed work: \_\_\_\_\_  
\_\_\_\_\_ ☐
- (2) Description of the Safe Work Practices to be employed: \_\_\_\_\_ ☐
- (3) Results of the Shock Hazard Analysis: \_\_\_\_\_ ☐
- (4) Determination of Shock Protection Boundaries: \_\_\_\_\_ ☐
- (5) Results of the Flash Hazard Analysis: \_\_\_\_\_ ☐
- (6) Determination of the Flash Protection Boundary: \_\_\_\_\_ ☐
- (7) Necessary personal protective equipment to safely perform the assigned task: \_\_\_\_\_ ☐
- (8) Means employed to restrict the access of unqualified persons from the work area: \_\_\_\_\_ ☐
- (9) Evidence of completion of a Job Briefing including discussion of any job-related hazards: \_\_\_\_\_ ☐
- (10) Do you agree the above described work can be done safely? ☐ Yes ☐ No (If *no*, return to requester) ☐

\_\_\_\_\_  
Electrically Qualified Person(s)

\_\_\_\_\_  
Date

\_\_\_\_\_  
Electrically Qualified Person(s)

\_\_\_\_\_  
Date

**PART III: APPROVAL(S) TO PERFORM THE WORK WHILE ELECTRICALLY ENERGIZED:**

\_\_\_\_\_  
Subcontractor Supervisor

\_\_\_\_\_  
SNS/CNMS Electrical Safety Officer

\_\_\_\_\_  
Project Manager

\_\_\_\_\_  
SNS/CNMS Level II Manager



## APPENDIX G: APPROACH BOUNDARIES TO LIVE PARTS FOR SHOCK PROTECTION

(Derived from NFPA 70E)

Nominal System Voltage Range, Phase to phase	Limited Approach Boundary <sup>1</sup>			Restricted Approach Boundary <sup>2</sup> Includes Inadvertent Movement	Prohibited Approach
	Exposed Movable Conductor Adder	Exposed Fixed Circuit Part Boundary <sup>3</sup>			
0 to 50	Not Specified	Not specified	Not Specified	Not specified	
51 to 300	10 ft 0 in	3 ft 6 in	Avoid Contact	Avoid Contact	
301 to 750	10 ft 0 in	3 ft 6 in	1 ft 0 in	0 ft 1 in	
751 to 15kV	10 ft 0 in	5 ft 0 in	2 ft 2 in	0 ft 7 in	
15.1kV to 36kV	10 ft 0 in	6 ft 0 in	2 ft 7 in	0 ft 10 in	
36.1kV to 46kV	10 ft 0 in	8 ft 0 in	2 ft 9 in	1 ft 5 in	
46.1kV to 72.5kV	10 ft 0 in	8 ft 0 in	3 ft 3 in	2 ft 1 in	
72.6kV to 121kV	10 ft 8 in	8 ft 0 in	3 ft 2 in	2 ft 8 in	
138kV to 145kV	11 ft 0 in	10 ft 0 in	3 ft 7 in	3 ft 1 in	
161kV to 169kV	11 ft 8 in	11 ft 8 in	4 ft 0 in	3 ft 6 in	
230kV to 242kV	13 ft 0 in	13 ft 0 in	5 ft 3 in	4 ft 9 in	
345kV to 362kV	15 ft 4 in	15 ft 4 in	8 ft 6 in	8 ft 0 in	
500kV to 550kV	19 ft 0 in	19 ft 0 in	11 ft 3 in	10 ft 9 in	
765kV to 800kV	23 ft 9 in	23 ft 9 in	14 ft 11 in	14 ft 5 in	

<sup>1</sup> Limited Approach Boundary - A shock protection boundary to be crossed by only qualified persons (at a distance from a live part) which is not to be crossed by unqualified persons unless escorted by a qualified person.

<sup>2</sup> Restricted Approach Boundary - A shock protection boundary to be crossed by only qualified persons (at a distance from a live part) which, due to its proximity to a shock hazard, requires the use of shock protection techniques and equipment when crossed.

<sup>3</sup> Prohibited Approach Boundary - A shock protection boundary to be crossed by only qualified persons (at a distance from a live part) which, when crossed by a body part or object, requires the same protection as if direct contact is made with a live part.

## APPENDIX H: WORK TASKS AND RELATED HAZARD CATEGORY

(Derived from NFPA 70E)

Task (Assumes Equipment is Energized, and Work Is Done Within the Flash Protection Boundary)	Hazard/Risk Category	V-rated Gloves	V-rated Tools
<b>Equipment rated below 240 volts; i.e., 120/208 panels with &lt;125KVA transformer in its immediate power supply– Note 7</b>	0	-	-
<b>Panelboards rated 240 V and below – Notes 1 and 3</b>	0	-	-
Circuit breaker (CB) or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	0	N	N
Work on energized parts, including voltage testing	1	Y	Y
Remove/install CBs or fused switches	1	Y	Y
Removal of bolted covers (to expose bare, energized parts)	1	N	N
Opening hinged covers (to expose bare, energized parts)	0	N	N
<b>Panelboards or Switchboards rated &gt;240 V and up to 600 V (with molded case or insulated case circuit breakers) – Notes 1 and 3</b>	-	-	-
CB or fused switch operation with covers on	0	N	N
CB or fused switch operation with covers off	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
<b>600 V Class Motor Control Centers (MCCs) – Notes 2 (except as indicated) and 3</b>	-	-	-
CB or fused switch or starter operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	0	N	N
CB or fused switch or starter operation with enclosure doors open	1	N	N
Work on energized parts, including voltage testing	2*	Y	Y
Work on control circuits with energized parts 120 V or below, exposed	0	Y	Y
Work on control circuits with energized parts >120 V exposed	2*	Y	Y
Insertion or removal of individual starter “buckets” from MCC – Note 4	3	Y	N
Application of safety grounds, after voltage test	2*	Y	N
Removal of bolted covers (to expose bare, energized parts) – Note 4	2*	N	N
Opening hinged covers (to expose bare, energized parts)	1	N	N
<b>600 V Class Switchgear (with power circuit breakers or</b>	-	-	-
	0	N	N

## APPENDIX H: WORK TASKS AND RELATED HAZARD CATEGORY

(Derived from NFPA 70E)

Task (Assumes Equipment is Energized, and Work Is Done Within the Flash Protection Boundary)	Hazard/Risk Category	V-rated Gloves	V-rated Tools
<b>fused switches) – Notes 5 and 6</b>			
CB or fused switch operation with enclosure doors closed	1	N	N
CB or fused switch operation with enclosure doors open	2*	Y	Y
Work on energized parts, including voltage Testing	0	Y	Y
Work on control circuits with energized parts 120V or below, exposed	2*	Y	Y
Work on control circuits with energized parts >120V exposed	3	N	N
Insertion or removal (racking) of CBs from cubicles, doors open	2	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	2*	Y	N
Application of safety grounds, after voltage test	3	N	N
Removal of bolted covers (to expose bare, energized parts)	2	N	N
Opening hinged covers (to expose bare, energized parts)	-	-	-
<b>Other 600 V Class (277 V through 600 V, nominal) Equipment – Note 2 (except as indicated) and 3</b>			
Lighting or small power transformers (600 V, maximum)	2*	N	N
Removal of bolted covers (to expose bare, energized parts)	1	N	N
Opening hinged covers (to expose bare, energized parts)	2*	Y	Y
Work on energized parts, including voltage testing	2*	Y	N
Application of safety grounds, after voltage test	-	-	-
Revenue meters (kW-hour, at primary voltage and current)	2*	Y	N
Insertion or removal	1	N	N
Cable trough or tray cover removal or installation	1	N	N
Miscellaneous equipment cover removal or installation	2*	Y	Y
Work on energized parts, including voltage testing	2	Y	N
Application of safety grounds, after voltage test			
	0	N	N
<b>NEMA E2 (fused contactor) Motor Starters, 2.3 kV through 7.2 kV</b>			
Contactor operation with enclosure doors closed	0	N	N
Reading a panel meter while operating a meter switch	2*	N	N
	3	Y	Y

## APPENDIX H: WORK TASKS AND RELATED HAZARD CATEGORY

(Derived from NFPA 70E)

Task (Assumes Equipment is Energized, and Work Is Done Within the Flash Protection Boundary)	Hazard/Risk Category	V-rated Gloves	V-rated Tools
Contactors operation with enclosure doors open	0	Y	Y
Work on energized parts, including voltage testing	3	Y	Y
Work on control circuits with energized parts 120 V or below, exposed	3	N	N
Work on control circuits with energized parts >120V, exposed	2	N	N
Insertion or removal (racking) of starters from cubicles, doors open	3	Y	N
Insertion or removal (racking) of starters from cubicles, doors closed	4	N	N
Application of safety grounds after voltage test	3	N	N
Removal of bolted covers (to expose bare, energized parts)	2	N	N
Opening hinged covers (to expose bare, energized parts)	0	N	N
<b>Metal Clad Switchgear, 1 kV and above</b>	4	N	N
CB or fused switch operation with enclosure doors closed	4	Y	Y
Reading a panel meter while operating a meter switch	2	Y	Y
CB or fused switch operation with enclosure doors open	4	Y	Y
Work on energized parts, including voltage testing	4	N	N
Work on control circuits with energized parts 120 V or below, exposed	2	N	N
Work on control circuits with energized parts >120 V, or exposed	4	Y	N
Insertion or removal (racking) of CBs from cubicles, doors open	4	N	N
Insertion or removal (racking) of CBs from cubicles, doors closed	3	N	N
Application of safety grounds, after voltage test	4	N	N
Removal of bolted covers (to expose bare, energized parts)			
Opening hinged covers (to expose bare, energized parts)	-	-	-
Opening voltage transformer or control power transformer compartments	2	N	N
	4	Y	Y
	4	N	N

## APPENDIX H: WORK TASKS AND RELATED HAZARD CATEGORY

(Derived from NFPA 70E)

Task (Assumes Equipment is Energized, and Work Is Done Within the Flash Protection Boundary)	Hazard/Risk Category	V-rated Gloves	V-rated Tools
<b>Other Equipment 1 kV and above</b>	3	N	N
Metal clad load interrupter switches, fused or unfused	3	Y	Y
Switch operation, doors closed	2	N	N
Work on energized parts, including voltage testing	4	Y	N
Removal of bolted covers (to expose bare, energized parts)	2	Y	N
Opening hinged covers (to expose bare, energized parts)			
Outdoor disconnect switch operation (hookstick operated)			
Outdoor disconnect switch operation (gang-operated, from grade)			
Insulated cable examination, in manhole or other confined space			
Insulated cable examination, in open area			

**Legend:**

**V-rated Gloves** are gloves rated and tested for the maximum line-to-line voltage upon which work will be done.

**V-rated Tools** are tools rated and tested for the maximum line-to-line voltage upon which work will be done.

**2\*** means that a double-layer switching hood and hearing protection are required for this task in addition to the other Hazard/Risk Category 2 requirements of Table 4.

**Y** = yes (required)

**N** = no (not required)

**Notes:**

1. Maximum of 25 kA short circuit current available, 0.03 second (2 cycle) fault clearing time.
2. Maximum of 65 kA short circuit available, 0.03 second (2 cycle) fault clearing time.
3. For < 10 kA short circuit current available, the Hazard/Risk Category required may be reduced by one number.
4. 42 kA short circuit current available, 0.33 second (20 cycle) fault clearing time.
5. 35 kA short circuit current available, up to 0.5 second (30 cycle) fault clearing time.
6. For < 25 kA short circuit current available, the Hazard/Risk Category required may be reduced by one number.

# APPENDIX I: PROTECTIVE CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT MATRIX

(Derived from NFPA 70E)

Protective Clothing & Equipment		Protective Systems for Hazard/Risk Category					
Hazard/Risk Category Number	(Note 3)	-1	0	1	2	3	4
<b>Untreated Natural Fiber</b>		—	—	—	—	—	—
a. T-shirt (short sleeve)	X			X	X	X	
b. Shirt (long sleeve)		X					
c. Pants (long)		X	X (Note 4)	X (Note 6)	X	X	X
<b>FR Clothing</b> (Note 1)		—	—	—	—	—	—
a. Long-sleeve shirt			X	X	X (Note 9)	X	
b. Pants			(Note 4)	X (Note 6)	X (Note 9)	X	X
c. Coverall			(Note 5)	(Note 7)	(Note 9)	X (Note 5)	
d. Jacket, parka, or rainwear			AN	AN	AN	AN	
<b>FR Protective Equipment</b>		—	—	—	—	—	—
a. Flash suit jacket (2-layer)							X
b. Flash suit pants (2-layer)							X
c. Head protection	—	—	—	—	—	—	—
1. Hard hat				X	X	X	X
2. FR hard hat liner					AR	AR	
d. Eye protection			—	—	—	—	—
1. Safety glasses	X	X	X	AL	AL	AL	
2. Safety goggles				AL	AL	AL	
e. Face & head protection	—	—	—	—	—	—	—
1. Arc-rated face shield or flash shield hood				X (Note 8)			
2. Flash suit hood					X	X	
3. Hearing protection (ear canal inserts)				AR (Note 8)	X	X	
<b>Protective Clothing &amp;</b>							

## APPENDIX I: PROTECTIVE CLOTHING AND PERSONAL PROTECTIVE EQUIPMENT MATRIX

(Derived from NFPA 70E)

Equipment	Protective Systems for Hazard/Risk Category					
Hazard/Risk Category Number (Note 3)	-1	0	1	2	3	4
f. Hand Protection Leather gloves (Note 2)			AN	X	X	X
g. Foot Protection Leather work shoes			AN	X	X	X

Page 2 of 2

### Legend:

AN = As needed

AL = Select one in group

AR = As required

X = Minimum required

### Notes:

1. See Table 4 Arc rating for a garment is expressed in cal/cm<sup>2</sup>.
2. If voltage-rated gloves are required, the leather protectors worn external to the rubber gloves satisfy this requirement.
3. Hazard/Risk Category Number “-1” is only defined if determined by Notes 3 or 6 of Table 5.
4. Regular weight (minimum 12 oz/yd<sup>2</sup> fabric weight), untreated, denim cotton blue jeans are acceptable in lieu of FR pants. The FR pants used for Hazard/Risk Category 1 shall have a minimum arc rating of 4.
5. Alternate is to use FR coveralls (minimum arc rating of 4) instead of FR shirt and FR pants.
6. If the FR pants have a minimum arc rating of 8, long pants of non-melting or untreated natural fiber are not required beneath the FR pants.
7. Alternate is to use FR coveralls (minimum arc rating of 4) over non-melting or untreated natural fiber pants and T-shirt.
8. A faceshield with a minimum arc rating of 8, with wrap-around guarding to protect not only the face, but also the forehead, ears, and neck (or, alternatively, a flash suit hood), is required.
9. Alternate is to use two sets of FR coveralls (the inner with a minimum arc rating of 4 and outer coverall with a minimum arc rating of 5) over non-melting or untreated natural fiber clothing, instead of FR coveralls over FR shirt and FR pants over non-melting or untreated natural fiber clothing.

## APPENDIX J: SIMPLIFIED, TWO CATEGORY, FLAME-RESISTANT (FR) CLOTHING SYSTEM

**Use of Simplified Approach.** The use of Table 4 is suggested as a simplified approach to assure adequate PPE for electrical workers within facilities with large and diverse electrical systems. The clothing listed in Table 4 fulfills the minimum FR clothing requirements of Table 3 and Table 6. The clothing systems listed in this table should be used with other PPE appropriate for the Hazard/Risk Category. See Table 6.

**Table 4: Simplified, Two Category, Flame Resistant Clothing System**

Clothing*	Applicable Tasks
<p><b>Everyday Work Clothing</b></p> <p>FR long-sleeve (minimum arc rating of 4) worn over an untreated cotton T-shirt with FR pants (minimum arc rating of 8)</p> <p><i>or</i></p> <p>FR coveralls (minimum arc rating of 4) worn over an untreated cotton T-shirt (or an untreated natural fiber long-sleeve shirt) with untreated natural fiber pants.</p>	<p>All Hazard/Risk Category 1 and 2 listed in Table 6</p> <p>On systems operating at less than 1,000 volts, these tasks include work on all equipment <i>except</i></p> <ul style="list-style-type: none"> <li>• Insertion or removal of low-voltage motor starter “buckets,”</li> <li>• Insertion or removal of power circuit breakers from switchgear cubicle or</li> <li>• Removal of bolted covers from switchgear.</li> </ul> <p>On systems 1,000 volts or greater, tasks also include the operation of switching devices <i>with equipment enclosure doors closed</i>.</p>
<p><b>Electrical “Switching” Clothing</b></p> <p>Multilayer FR flash jacket and FR bib overalls worn over either FR overalls (minimum arc rating of 4) or FR long-sleeve shirt and FR pants (minimum arc rating of 4), worn over untreated natural fiber long-sleeve shirt and pants, worn over an untreated cotton T-shirt</p> <p><i>or</i></p> <p>Insulated FR overalls (with a minimum arc rating of 25, independent of other layers) worn over untreated natural fiber long-sleeve shirt with untreated denim cotton blue jeans (“regular writhe”, minimum 12 oz/yd<sup>2</sup> fabric weight), worn over an untreated cotton T-shirt.</p>	<p>All Hazard/Risk Category 3 and 4 tasks listed in Table 6.</p> <p>On systems operating at 1,000 volts or greater, these tasks include work on exposed live parts of all equipment.</p> <p>On systems of less than 1,000 volts, tasks include insertion or removal of low-voltage motor starter MCC “buckets”, insertion or removal of plug-in devices into or from busaway, insertion or removal of power circuit breakers and removal of bolted covers from switchgear.</p>

\* Note other PPE required for the specific tasks listed in Tables 5 and 6, which include arc-rated face shields or flash suit hoods, FR hardhat liners, safety glasses or safety goggles, hard hat, bearing protection, leather gloves, voltage-rated gloves, and voltage-rated tools.



## APPENDIX K: GLOVE VOLTAGE REQUIREMENTS

Class Designation of Glove or Sleeve	Maximum AC Use Voltage rms, V	AC Retest Voltage rms, V	Maximum DC Use Voltage avg, V	DC Retest Voltage avg, V
00	500	2 500	750	10 000
0	1 000	5 000	1 500	20 000
1	7 500	10 000	11 250	40 000
2	17 000	20 000	25 500	50 000
3	25 500	30 000	39 750	60 000
4	36 000	40 000	54 000	70 000

## APPENDIX L: PROTECTIVE CLOTHING CHARACTERISTICS

(Table derived from NFPA 70E)

Typical Protective Clothing Systems		
Hazard Risk Category	Clothing Description (Typical number of clothing layers is given in parentheses)	Required Minimum Arc Rating of PPE [(cal/cm <sup>2</sup> ) J/cm <sup>2</sup> ]
0	Non-melting, flammable materials (i.e., untreated cotton, wool, rayon, or silk, or blends of these materials, with a fabric weight at least 4.5 oz/yd <sup>2</sup> (1)	
1		4 (16.74)
2	FR shirt and FR pants or FR overall (1)	8 (33.47)
3	Cotton underwear – conventional short sleeve and brief/shorts, plus FR shirt and FR pants (1 or 2)	25 (104.6)
4	Cotton underwear plus FR shirt and FR pants plus FR coverall, or cotton underwear plus two FR coveralls (2 or 3)	40 (169.36)
	Cotton underwear plus FR shirt and FR pants plus multi-layer flash suit (3 or more)	

NOTE: Arc rating is defined in Article 100 and can be either ATPV or E<sub>BT</sub>. ATPV is defined in ASTM F 1959-99 as the incident energy on a fabric or material that results in sufficient heat transfer through the fabric or material to cause the onset of a second-degree burn based on the Stoll curve. E<sub>BT</sub> is defined in ASTM F 1959-99 as the average of the five highest incident energy exposure values below the Stoll curve where the specimens do not exhibit breakopen. E<sub>BT</sub> is reported when ATPV cannot be measured due to FR fabric breakopen.

## APPENDIX M: VOLTAGE REQUIREMENTS FOR BLANKETS

Class Designation of Blankets	AC Use Voltage, rms, max <sup>A</sup>	A-C Retest Voltage max	DC Retest Voltage, max
0	1 000	5 000	20 000
1	7 500	10 000	40 000
2	17 000	20 000	50 000
3	26 500	30 000	60 000
4	36 000	40 000	70 000

<sup>a</sup>The maximum use voltage is based on the following equations:

Maximum a-c use voltage = 0.95 a-c maximum retest voltage – 2 000<sub>v</sub>  
Classes 1, 2, 3, and 4.

Maximum a-c use voltage = 0.95 d-c maximum retest voltage – 30 500<sub>v</sub>  
Classes 1, 2, 3, and 4.

Maximum a-c use voltage = 0.95 d-c maximum retest voltage – 18 000<sub>v</sub>  
Class 0.

## APPENDIX N: EXCAVATION/ PENETRATION PERMIT

<b>SECTION A – Initiation</b>	NUMBER
PROJECT/JOB TITLE	SUBCONTRACT NO.
REQUESTOR <i>(Name/Organization)</i>	PHONE
DESCRIPTION OF WORK	
LOCATION: <i>(Area/Building/Floor/Column)</i>	
DRAWING / SKETCH NUMBER(S)	

On the basis of information available, underground, embedded or hidden utilities marked “YES” in the table below are known to exist at or adjacent to the excavation/penetration covered by this permit. This listing may not be a complete description of all obstructions. Site utilities drawings are not complete and may contain inaccuracies. Those performing excavation penetration work must be alert to encountering uncharted or inaccurately charted underground obstructions. **STOP WORK IMMEDIATELY** and contact the permit issuer if obstructions other than those defined are encountered.

<b>SECTION B – Review</b>											
UTILITY	DISC	YES	INITIAL	UTILITY	DISC	YES	INITIAL	UTILITY	DISC	YES	INITIAL
1. SANITARY SEWERS	CV			6. CHILLED WATER	ME			11. PROCESS WASTE			
2. STORM DRAINS	CV			7. COOLING WATER	ME			12. NATURAL GAS			
3. ELECTRICAL	EE			8. POTABLE/ FIREWATER	ME			13. CRYO CHASE			
4. GROUND GRID	EE			9. HOT WATER	ME			14. EXH DUCTWORK			
5. SANITARY WATER	CV			10. TOWER WATER	ME			15. OTHER (LIST)			
CIVIL AND SITE ENGINEERING REVIEW (CV)					REVIEWER			PHONE		DATE	
ELECTRICAL ENGINEERING REVIEW (EE)					REVIEWER			PHONE		DATE	
MECHANICAL/PIPING ENGINEERING REVIEW (ME)					REVIEWER			PHONE		DATE	

<b>SECTION C – Approval</b>			
PERMIT REVIEWED: IS ADDITIONAL KNOWN INFORMATION TO BE PROVIDED? <input type="checkbox"/> NO <input type="checkbox"/> YES IF YES, SPECIFY DETAILS:			
Project Manager	DATE		DATE
<b>SECTION D – Issue</b>			
PERMIT ISSUED TO: SUBCONTRACTOR OTHER		SIGNATURE – Subcontractor’s Competent Individual	DATE
<input type="checkbox"/> E/PP and JSA have been reviewed with the subcontractor prior to execution of work. <input type="checkbox"/> Positive location of line is required before excavation.		SIGNATURE – Project Manager	DATE
<b>SECTION E – Closeout</b>			
Verification that work is complete and any changes are noted on a drawing or a sketch.		SIGNATURE - SUBCONTRACTOR	DATE
Acknowledged/Filed		SIGNATURE – Project Manager	DATE

Each section is discussed in more detail below.

Prior to initiating a Permit, the Requestor shall review the following list of exclusions:

**Excavation Activities Exclusions**

1. Soil borrow areas pre-designated by the Project Manager
2. Replacement of the same location, depth, and size as the items being replaced (i.e. sign posts, etc.)
3. Earth / rock excavations 12 inches or less in depth with surface area not in excess of 25 square feet, using hand held tools excluding jackhammers

**Penetration Activities Exclusions**

1. Penetration of masonry walls
2. Penetration of soil borrow area pre-designated by the Project Manager
3. Work associated with the installation of fasteners to floors, walls, and ceilings of new construction.
4. Penetration of dry wall partitions in new construction where JSA clearly requires use of circuit detector or conduit locator.

**SECTION A — Initiation of the Excavation/Penetration Permit (E/PP)**

The Requestor will:

- Complete Section A of the E/P Permit except for the E/PP number.
- Attach sketches or marked up drawings showing location of each excavation or penetration.
- Attach the JSA for the work activity resulting from a thorough field investigation.
- Forwards the E/P Permit and attachments to the Project Manager

The Project Manager/Designee will review and forward the E/PP to one of the Engineer/Inspectors(E/I).

The Engineer/Inspector will record the unique E/PP number in Section A and record the E/PP in the Excavation/ Penetration Permit Log.

**SECTION B — Review of the Excavation/Penetration Permit (E/PP)**

Each E/I will perform the following in the appropriate block of Section B:

- Review the E/PP and check (✓) “YES” or write “NO” and initial the appropriate discipline block.
- Add necessary comments.
- Record name, phone number and date.

The E/I will attach marked up copies of reference drawings.

**SECTION C — Approval of the Excavation/Penetration Permit (E/PP)**

The Project Manager/Designee will review the E/PP and document review in Section C, sign and date.

The E/I will return the E/PP to the Requester.

**SECTION D — Execution and Issue of the Excavation/Penetration Permit (E/PP)**

The Project Manager/Designee will review the E/PP and JSA with the Subcontractor Supervision before field activities begin.

The Project Manager/Designee and Subcontractor will complete, sign and date Section D.

\* Field conditions encountered that are different from those shown on this permit shall be documented.

**SECTION E — Closeout of Excavation/Penetration Permit (E/PP)**

The subcontractor shall return the E/PP to the Project Manager/Designee when the work is complete.

If any changes were made to underground electrical or mechanical features, a red lined mark-up drawing or sketch of the changes shall be attached to the E/PP.

The Project Manager/Designee will sign the E/PP to verify that the work is complete and any changes properly noted and that the E/PP is closed out.

**NOTES**

1. A meeting between the permit issuer and recipient to determine the need for surveys using detection equipment and/or personnel protective measures is required.
2. Lockout and tagout all energized utility systems that present hazards to workers. As first work activity under this permit, hand excavate at existing utilities until precise location is determined. Complete excavation around utility PRIOR to re-energizing system. Hand excavation is required within 5 feet of all cables not protected by ductbanks.
3. Permit EXPIRES 15 days from date signed by issuer and must be resubmitted if work is to continue. No renewals will be granted.
4. If there is to be excavation within 5 feet of any communication line or potential energy source, positive location of the line shall be conducted using the Metrotech Pipe and Cable locating system. The Project Manager Lockout/Tagout supervisor shall be contacted prior to hand excavating and the communication, electrical, or mechanical service shall be locked out and tagged out with a Project Manager's lock.
5. A copy of this E/PP shall be available for review at the work site at all times when work associated with this E/PP is being done.
6. Penetration permit is required for work associated with installation of fasteners in floors and walls or penetration of dry wall in construction turned over to Plant Operations.
7. Penetration permit is required for all core drilling.

## APPENDIX O: CRITICAL LIFT PERMIT

### CRITICAL LIFT PERMIT

#### Section I: Approvals and Documentation

##### A. Identification

Subcontract Number: \_\_\_\_\_ Location: \_\_\_\_\_

Lift Identification Name: \_\_\_\_\_

Date of Lift: \_\_\_\_\_ Time: \_\_\_\_\_

Lift Description: \_\_\_\_\_

##### B. Approvals (Signatures Required)

Subcontractor Field Manager/S&H: \_\_\_\_\_  
Date \_\_\_\_\_

Subcontractor Lift Supervisor: \_\_\_\_\_  
(This individual is to be present during the lift)  
Date \_\_\_\_\_

Project Engineer: \_\_\_\_\_  
Date \_\_\_\_\_

Project Manager: \_\_\_\_\_  
Date \_\_\_\_\_

Operator: \_\_\_\_\_  
Date \_\_\_\_\_

Project S&H: \_\_\_\_\_  
Date \_\_\_\_\_

SNS/CNMS Level II Manager: \_\_\_\_\_  
Date \_\_\_\_\_

##### C. Attachments

- \_\_\_\_\_ 1. Operator Certifications
- \_\_\_\_\_ 2. Capacity Certificates and Inspection Reports for all other Lifting Equipment
- \_\_\_\_\_ 3. Inspection Reports for all Rigging Equipment
- \_\_\_\_\_ 4. Rigging Diagram
- \_\_\_\_\_ 5. Free Body Diagram

## APPENDIX O: CRITICAL LIFT PERMIT (PAGE 2 OF 5)

### Section II: Pre-Lift Planning

#### A. Pre-Lift Checklist

		(Initials)	
		Yes	No
1.	Has an inventory of equipment been done?	_____	_____
2.	Have weather conditions been considered?	_____	_____
3.	Have the general safety precautions been reviewed?	_____	_____
4.	Have the electrical safety procedures been reviewed?	_____	_____
5.	Have the safe rigging practices been implemented?	_____	_____
6.	Have the safety precautions been reviewed?	_____	_____
7.	Has a method of attachment and handling been determined?	_____	_____
8.	Are all lifting lugs engineered to specifications?	_____	_____
9.	Has the matting been inspected and approved?	_____	_____
10.	Has the stability of the ground been assured?	_____	_____
11.	Is a tag line going to be used?	_____	_____
12.	Have disconnecting/connecting means been developed?	_____	_____
13.	Has the orientation of equipment been confirmed?	_____	_____
14.	Is survey equipment required?	_____	_____
15.	Is a Pre-Lift Meeting planned?	_____	_____
16.	Is a total weight below 95% of capacity?	_____	_____
17.	Are all required approvals signed?	_____	_____



## APPENDIX O: CRITICAL LIFT PERMIT (PAGE 3 OF 5)

### Section III — Load and Capacity Calculations

#### A. Weight of Equipment - Live Load

1. Equipment Condition	New ( )	Used ( )
2. Weight of Equipment Empty	_____	lbs.
3. Weight of Attachments:		
a. Platforms and Ladders	_____	lbs.
b. Piping and Accessories	_____	lbs.
c. Liquids Inside	_____	lbs.
d. Dirt and Debris	_____	lbs.
e. Internal Trays or Liners	_____	lbs.
4. Total Weight of Equipment	_____	lbs.

#### B. Total Load

##### Erection Crane

1. Percent of Equipment Weight	_____ %	7. Weight of Jib Erected	_____ lbs.
2. Amount of Equipment Weight	_____ lbs.	Stored	_____ lbs.
3. Weight of Headache Ball	_____ lbs.	8. Weight of Jib Headache Ball	_____ lbs.
4. Weight of Block	_____ lbs.	9. Weight of Cable (Load Fall)	_____ lbs.
5. Weight of Lifting Bar	_____ lbs.	10. Auxiliary Boom Head	_____ lbs.
6. Weight of Slings and Shackles	_____ lbs.	11. Other: _____	_____ lbs.

**TOTAL WEIGHT** \_\_\_\_\_ **lbs.**

##### Tailing Crane

1. Percent of Equipment Weight	_____ %	7. Weight of Jib Erected	_____ lbs.
2. Amount of Equipment Weight	_____ lbs.	Stored	_____ lbs.
3. Weight of Headache Ball	_____ lbs.	8. Weight of Jib Headache Ball	_____ lbs.
4. Weight of Block	_____ lbs.	9. Weight of Cable (Load Fall)	_____ lbs.
5. Weight of Lifting Bar	_____ lbs.	10. Auxiliary Boom Head	_____ lbs.
6. Weight of Slings and Shackles	_____ lbs.	11. Other: _____	_____ lbs.

**TOTAL WEIGHT** \_\_\_\_\_ **lbs.**

Source of Load Weight \_\_\_\_\_  
(Name Plate, Drawings, Calculated, Weighed)

Weights Verified By: \_\_\_\_\_

## APPENDIX O: CRITICAL LIFT PERMIT (PAGE 4 OF 5)

### C. Capacities of the Crane

#### Erection Crane Configuration

1. Type of Crane \_\_\_\_\_
2. Rated Capacity \_\_\_\_\_ Tons
3. Lifting Arrangement
  - a. Max. Radius During Lift \_\_\_\_\_ ft.
  - b. Length of Boom \_\_\_\_\_ ft.
  - c. Angle of Boom at Pick \_\_\_\_\_ deg.
  - d. Angle of Boom at Set \_\_\_\_\_ deg.
  - e. Rated Capacity Under Most Severe Conditions
    1. Over Rear \_\_\_\_\_ lbs.
    2. Over Front \_\_\_\_\_ lbs.
    3. Over Side \_\_\_\_\_ lbs.
  - f. Rated Capacity for Lift \_\_\_\_\_ lbs.
4. Jib
  - a. Is the Jib to be used \_\_\_\_\_
  - b. Length of Jib \_\_\_\_\_ ft.
  - c. Jib Angle \_\_\_\_\_ deg.
  - d. Rated Jib Capacity \_\_\_\_\_ lbs.
5. Cable
  - a. Number of Parts \_\_\_\_\_
  - b. Size of Cable \_\_\_\_\_ inch.
  - c. Maximum Capacity \_\_\_\_\_ lbs.

### D. Percent of Cranes Capacity

$$\frac{\text{Total Weight X 100}}{\text{Rated Capacity}} = \text{_____ \%}$$

### E. Size of Slings

1. Sling Selection
  - a. Type of Arrangement \_\_\_\_\_
  - b. Number of Slings to Hook \_\_\_\_\_
  - c. Sling Size \_\_\_\_\_ inch.
  - d. Sling Length \_\_\_\_\_ ft.
  - e. Rated Capacity \_\_\_\_\_ lbs.

## APPENDIX O: CRITICAL LIFT PERMIT (PAGE 5 OF 5)

### C. Capacities of the Crane (continued)

#### Tailing Crane Configuration

- |    |   |       |
|----|---|-------|
| 1. | Type of Crane                               |       |
| 2. | Rated Capacity                              | Tons  |
| 3. | Lifting Arrangement                         |       |
| a. | Max. Radius During Lift                     | ft.   |
| b. | Length of Boom                              | ft.   |
| c. | Angle of Boom at Pick                       | deg.  |
| d. | Angle of Boom at Set                        |       |
| e. | Rated Capacity Under Most Severe Conditions |       |
| 1. | Over Rear                                   | lbs.  |
| 2. | Over Front                                  | lbs.  |
| 3. | Over Side                                   | lbs.  |
| f. | Rated Capacity for Lift                     | lbs.  |
| 4. | Jib   |       |
| a. | Is the Jib to be used                       |       |
| b. | Length of Jib                               | ft.   |
| c. | Jib Angle                                   | deg.  |
| d. | Rated Jib Capacity                          | lbs.  |
| 5. | Cable                                       |       |
| a. | Number of Parts                             |       |
| b. | Size of Cable                               | inch. |
| c. | Maximum Capacity                            | lbs.  |

### D. Percent of Cranes Capacity

$$\frac{\text{Total Weight X 100}}{\text{Rated Capacity}} = \text{_____ \%}$$

### E. Sizing of Slings

- |    |                          |       |
|----|--------------------------|-------|
| 1. | Sling Selection          |       |
| a. | Type of Arrangement      |       |
| b. | Number of Slings to Hook |       |
| c. | Sling Size               | inch. |
| d. | Sling Length             | ft.   |
| e. | Rated Capacity           | lbs.  |

## APPENDIX P: SPECIAL SCAFFOLDING NOTICE

Describe the special scaffolding situation:

Describe the scaffolding task:

Identify hazardous conditions:

Type of scaffolding to be utilized:

Is the intended scaffolding area within 25 feet of an existing or occupied structure? ☐ Yes ☐ No

If yes, protection measures:

Will people or machinery be prevented from passing beneath the scaffold?

☐ Yes

☐ No (If no, attach a copy of the protective measures to be used to prevent injury or damage to those below the scaffold.)

Will materials be piled or stacked on the scaffold?

☐ Yes

☐ No

Are any special precautions required to protect workers while on the scaffold?

☐ Yes

☐ No

If yes, protection measures:

Other remarks or information:

Date:

Competent Person:

Company:

Safety Designee/Representative:

## APPENDIX Q: HOT WORK PERMIT

### Side 1

Date \_\_\_\_\_  
Building \_\_\_\_\_  
Dept. \_\_\_\_\_ Floor \_\_\_\_\_  
Work to be done \_\_\_\_\_

Special Precautions \_\_\_\_\_

Is Fire Watch Required? \_\_\_\_\_ Name \_\_\_\_\_

The location where this work is to be done has been examined, necessary precautions taken, and permission is granted for this work. (see other side).

Permit Expires \_\_\_\_\_

Signed \_\_\_\_\_  
Permit Authorizing Individual

Time Started \_\_\_\_\_  
Time Completed \_\_\_\_\_

### FINAL CHECK

Work area and all adjacent areas to which sparks and heat might have spread ( including floors above and below and on opposite side of wall(s) were inspected 30 minutes after the work was completed and were found firesafe.

Signed \_\_\_\_\_  
Permit Authorizing Individual

## Side 2

### ATTENTION

Before approving any hot work permit, the PAI shall inspect the work area and confirm that precautions have been taken to prevent fire in accordance with NFPA 51B

### PRECAUTIONS

- ☐ Sprinklers in service
- ☐ Hot work equipment in good repair

#### WITHIN 35 FT OF WORK

- ☐ Floors swept clean of combustibles
- ☐ Combustible floors wet down, covered with damp sand, metal, or other shields
- ☐ All wall and floor openings covered
- ☐ Covers suspended beneath work to collect sparks

#### WORK ON WALLS OR CEILINGS

- ☐ Construction noncombustible and without combustible covering
- ☐ Combustibles moved away from opposite side of wall

#### WORK ON ENCLOSED EQUIPMENT (tanks, containers, ducts, etc)

- ☐ Equipment cleaned of all combustibles
- ☐ Containers purged of flammable vapors

### FIRE WATCH

- ☐ To be provided during and 30 minutes after operation
- ☐ Supplied with a fully charged and operable fire extinguisher
- ☐ Trained in use of equipment and in sounding fire alarm

### FINAL CHECK

- ☐ To be made 30 minutes after completion of any operation unless fire watch is provided

Signed \_\_\_\_\_  
Permit Authorizing Individual (PAI)